Management Services in Government

November 1976 Volume 31 Number 4

Management Services in Government

Incorporating the O & M Bulletin

November 1976 Volume 31 Number 4

Published by the Civil Service Department, Management Services, in collaboration with Departmental Management Services Officers. Correspondence and contributions should be addressed to The Editor, Management Services in Government, Civil Service Department, Whitehall, London SW1A 2AZ

ISSN : 0307-8558

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An Inflated Bureaucracy?

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Introduction

The ordinary citizen is sure that there are too many public servants and that their numbers and their cost to the taxpayer should be cut. The story is international and public servants from all over the world come to see how the United Kingdom Civil Service controls its numbers and its gradings.

Is it true that there are too many civil servants and that their jobs are over-valued? It need not be true for it to be believed, but it is more readily believed if it could be true, and it could be true if there were no system of control.

The need for control

An administrative organization, left to itself without restraint, external or internal, will grow. If wages and salaries depend on profits, and profits depend on prices which are constrained by competition, there is an external restraint on the total wage bill whose effect will be related to the amount of labour which goes into the product. The more labour intensive the industry the more restraint there is on the wages bill and therefore on staff numbers, and the greater the competition the greater the restraint. There are ways in which the restraint can be eased, such as the use of price fixing agreements or by the taking over of competitors so that a monopoly is approached or achieved, though in the United Kingdom the use of these devices has been restricted by legislation. In the Civil Service, except in a very few, small instances, the external financial restraints found in a commercial organization do not exist.

The position of Parliament

In the absence of any external, automatic restraint, the Civil Service is left with the necessity for specially devised controls, either external or internal. An obvious external control is the restriction by Parliament of the number of civil servants or of the money to pay for them, or both, and every new piece of proposed legislation is accompanied by memoranda showing the expected financial cost and the number of civil servants who are expected to be necessary if the Bill becomes law. These memoranda must necessarily be based on forecasts of how the proposed legislation will operate, and this may depend on future events

which it is extremely difficult, if not impossible, to foresee: how many people will change their habits, how other countries will react if they have a change of Government, whether other factors will emerge which will result in more, or fewer, applications, claims, offences or whatever it is that the Bill affects. Even the weather, as we have seen recently, can do unexpected things and require the employment of public servants on matters, now vitally important, which even a few months ago would have seemed remote. So the control of Civil Service numbers by Parliament in advance can operate only with very broad application.

Development of the control function

Parliament may not for practical reasons itself control in detail the size of the Civil Service, but it can leave it to a Minister of the Crown to be responsible for the task, and to be answerable for how well, or how badly, he and his department have done the job. At the time when the necessity to control numbers and gradings first began to emerge the logical department to do it was the Treasury, and so the control of complements by the Treasury came into existence during the nineteenth century, alongside its control of conditions of service. It was essential in the conditions at that time, with the concept still new of a Civil Service recruited for ability and not by patronage, that the control should be a detailed one. The control could be detailed because the field of government activity was much narrower, and the Civil Service correspondingly much smaller, than it is today.

Until 1939 not one additional clerk or cleaner, let alone anyone of more exalted rank, could be engaged by a department without the authority of the Lords Commissioners of the Treasury, and each post was authorized for a certain part of each office and could in no circumstances be moved without their Lordships' authority. The only exception was in the Post Office where in 1933 the Treasury had agreed that complements could be varied without the prior sanction of the Treasury in any grades whose maximum annual salary did not exceed £600. Other departments continued under the nineteenth-century system and even the most trivial variations in complements had to be submitted for Treasury approval.

The second world war soon showed that the nineteenth-century machinery had reached the limit of its capacity. Departments expanded at such a rate and the need for variations in staff numbers was so urgent that the Treasury would not have been able to cope had the system been maintained. The Treasury agreed that more departments should adopt the Post Office practice and be free to vary their complements in grades up to a specified level and only to report from time to time any increases which had been made. In some other cases 'block grants' of a specific number of posts in some higher grades were authorized to enable departments to use staff almost as if they themselves had the authority to create new posts. There were still some

departments where a changed system was not seen to be necessary and where the full Treasury control continued.

Shortly after the end of the second world war an interdepartmental committee examined the whole question of Treasury control of complements. In its report it pointed out that the Treasury had been able to delegate some of its functions to departments largely because of the growth in the standing and technical competence of departmental Establishment Divisions, and because the Principal Establishment Officer now held a key position in each department as the chief adviser to the Head of Department on its staff economy. The Principal Establishment Officer now performed, in relation to his own department, the function which the Treasury had earlier performed for the service as a whole, and, as the committee said, he had to determine:

(*a*) How far work was necessary.
(*b*) Whether a proposed organization was right and economical.
(*c*) How far the proposals were right in grading and numbers.
(*d*) What reserves in other parts of the department he could call upon to meet urgent needs.

The direct control of staff grading and numbers is part of the whole system of financial control with which civil servants are familiar: the Estimates and the Vote, and the responsibility of the Public Accounts Committee, and it is significant that the same person is often both Principal Establishment Officer and Principal Finance Officer.

Development of staff inspection

The Treasury realized that the best way for the Establishment Officer to be informed under the committee's four headings was either to go and see for himself or to send someone upon whom he could rely to find out for him. Establishment Officers were unlikely to have the time to make many visits themselves, so the second alternative was the practical one, and in a circular the Treasury asked departments to develop an efficient system of work survey or staff inspection. The inspection branch was to be under the direct control of the Establishment Officer and the circular said:

> Inspection so directed should produce manpower economies—indeed, that is a prime objective—but it will do so as a by-product of greater efficiency and not directly as a result of 'body-snatching'.

In 1949, the Treasury confirmed the doctrine of delegated authority for certain grades and this authority has since been extended until it now covers, broadly, grades up to Senior Principal (maximum salary £9,350) and equivalent with the exception of certain categories and some posts in particular areas overseas. The Treasury laid down the general principles on the control of staff numbers which would apply in the future. Two of the principles were:

> The control of numbers in the Civil Service can only be carried out with full efficiency by the Principal Establishment and Organization Officer of each department (whose appointment and removal is subject to the approval of the Prime Minister) acting on behalf of the Permanent Secretary and Accounting Officer. It is therefore intended that the responsibility and the powers of departments and of the Principal Establishment and Organization Officers, who are charged with this most important duty, should be increased and widened.
>
> In addition to exercising its general control over complements and numbers, the Treasury also has an important responsibility for securing an even standard of grading of posts throughout departments. This may necessitate rather closer examination of particular branches and posts than would be required from the point of view of numbers alone.

To meet these principles:

> An essential part of the new arrangements is that Heads of Departments should require their Principal Establishment and Organization Officers to ensure that a fully effective internal system of staff inspection is in operation. In making their arrangements, departments should be aware of the steps taken . . . to improve the exchange of ideas and techniques between departments.

A small team of staff inspectors would be appointed to the Treasury, selected from serving civil servants with special experience and skill in measuring the numbers and grading of staff. They would conduct test checks of particular blocks of complements and staffs and it would be part of their duty to help departments to improve their technique by passing on knowledge of procedures adopted elsewhere in the Service.

Staff inspection today

The Civil Service Department has taken over from the Treasury certain functions in the management of the Civil Service, including that of manpower control. In the years since 1949 techniques have been improved. As part of their task of ensuring that standards of grading and complementing are consistent right across the Civil Service, members of the CSD Staff Inspectorate take part in joint inspections with their departmental colleagues, undertake the initial training of all new staff inspectors and pass on knowledge of procedures and techniques. The CSD Staff Inspectorate has specialists in various aspects of the work and in complementing and grading in various fields who are available for consultation by departments.

The function of the staff inspector is to see how to get the organization, the numbers and the gradings right. It is not to achieve arbitrary staff cuts or, as the Lords Commissioners said as long ago as 1947, to indulge in 'body-snatching'.

The concept of staff inspection is simple. Someone in a large organization is responsible for the proper use of the most expensive resource of all—manpower. That person cannot know every part of the organization in detail so he cannot know whether manpower is being used effectively or wastefully. So he sends someone, experienced in the ways

of administration and trained for the job, to go and find out. Perhaps it is because the concept is so simple that the Civil Service has never said very much about it.

The policy now is for staff inspections to be planned so that every part of a department is visited once every three to four years, with special inspections where changes in manpower requirements occur, particularly because of new legislation.

There is no hard and fast routine for carrying out a staff inspection. Its application varies according to the type of organization; for departments, and even parts of departments, differ widely in the type of organization which is required. Staff inspection is not confined to administrative areas, but extends equally to the professional, technical and scientific fields. Staff inspectors carry out their assignments in a wide variety of places: offices, laboratories, defence establishments, workshops, prisons, covering the whole range of activities which are to be found in the Civil Service, a range which is much wider than many people dream of when they think of civil servants. The levels inspected range from the bottom to very near the top, and often right to the top. The inspection techniques have been evolved to suit the work done in all the variations of activities according to the requirements of each assignment.

A fundamental part of the staff inspector's job is an interview with each member of the staff, and it is an essential feature that it is the job and not the person doing it which is being assessed.

The sequence of the inspection is determined according to the nature and pattern of the work and its natural flow. The staff inspector normally sees the head of each section or branch first to determine the theme of the work and to obtain an overall view, then he proceeds with his interviews and returns to examine the post of its head and to discuss with him any provisional views on the subordinate posts.

Towards the end of his visit, and while there is still time to amplify his information, the staff inspector sees the head of the whole establishment which is being inspected. At this meeting, which is normally informal, the staff inspector outlines his provisional conclusions and invites comments. If in the course of the discussion which follows the need is seen for the clarification at first hand of any matters of fact the staff inspector will make any re-visits which may be necessary to parts of the establishment or will examine any further information which is produced. By the time the staff inspector leaves the establishment the facts should be agreed and the conclusions and recommendations clarified. He then writes his report.

In considering and assessing grading, jobs are analysed under factors which are appropriate to the work area and the principles which underlie analytical job evaluation are applied. In the assessment of workload, as distinct from grading, in the professional, technical, supervisory, managerial and considerative fields of work, the methods used in the Civil Service vary according to the area of work. They

involve the identification of the most suitable organizational structures and practices, using the skill and 'across-the-board' experience of staff inspectors to supplement the experience of management in identifying and appraising methods of assessing output and the utilization of staff resources.

The staff inspectorate of the Civil Service Department keeps itself informed about the development of management techniques within the Civil Service and outside it and, through its close association with departmental staff inspectors in joint inspections, is able to pass on the information.

Most people who have anything to do with staff inspection are aware that the title is far from being the best one. Unfortunately, most of the other possible titles have either already been used in other contexts or have acquired their own overtones. The main objection to the title is that it can give the impression that it is the members of the staff who are being appraised personally, though staff inspectors are careful to make it clear that it is the job, not the person doing it, with which they are concerned.

A joint interest

As staff inspection developed the danger was foreseen of an 'us and them' attitude between staff inspectors and management. In practice this situation has not been widely encountered. Management can be a lonely job and the staff inspector, with his experience in looking at other parts of the department or, in the case of the CSD staff inspector, in other parts of the Civil Service, can be a very useful visitor from outside with whom the manager can discuss his problems, especially those which concern the effective use of manpower. Staff inspectors are encouraged to see their role as pursuing a joint interest with management.

A problem of management in a large organization is that of giving up manpower which is no longer required. The manager who has a small reserve of staff is in the comfortable position of being ready for emergencies and in the Civil Service emergencies can arise suddenly and unexpectedly, very often because a Member of Parliament or the press has decided to bring to the public notice something which has gone wrong or is thought to have gone wrong. The manager who keeps his manpower down to the minimum and then cannot cope with an emergency gets far more blame than the manager who is found to have too many staff. To change this state of affairs would mean changing a great many ways of life, not all of them peculiar to the Civil Service, and in the absence of these perhaps impossible, or even undesirable, changes it can be a help to management to have a second opinion—or even someone to blame—when a contingent reserve of staff is no longer to be available.

There has long been a tradition in the Civil Service of management and the staff associations, or in Civil Service terms the official and staff

sides, working together, and staff inspectors have always been conscious of this tradition. The precise way in which staff sides are involved in the implementation of staff inspection reports varies from department to department and, like staff inspection itself, is developing.

Staff inspectors maintain the personal independence which is essential to the proper fulfilment of their function, and therefore carry out their surveys and reach their conclusions on their own responsibility, so it is not surprising that many of them are apprehensive lest any suggestion that their function is to implement arbitrary staff cuts should mar their good relations with management and staff. They are conscious of the fact that they are a vital part of a control system which has been developed to meet the particular work environment of a bureaucracy. And an organization like the Civil Service which has such a system can feel unjustly set upon when it hears about the uncontrolled expansion of the Civil Service. There are areas of over-manning in every large organization and the Civil Service is no exception, but we at least have a system to locate the over-manning and the under-manning. The proper understanding and functioning of that system, helped by everyone, management and staff alike, is an answer to attacks on an 'inflated bureaucracy'.

Microfilming in the Valuation Office

T. R. PECKHAM and R. BROOKS, Inland Revenue

Terry Peckham was formerly in the Valuation Office MS unit; Roy Brooks is in Central MS, Board of Inland Revenue. Both were members of a project team set up in 1973 to consider the feasibility of introducing a microfilm system in Valuation Offices in England and Wales. The article that follows describes how they set about their task and the results achieved. —*Editor.*

Background

The Valuation Office (VO), a Branch of the Inland Revenue Department, operates through a network of local offices in England and Wales and has two main functions. The first is the valuation of land and buildings for a variety of taxation purposes and the provision of valuation and negotiation services to Government Departments and local authorities in connection with the acquisition, lease and sale of land, etc, for statutory purposes such as roads, housing, schools and redevelopment. These activities are known internally as Revenue and Compensation (R & C) work. The second is more recently acquired—the production and maintenance of valuation lists for rating purposes taken over from local authorities in 1950; and this aspect of the work did not form part of the review described here.

The VO had been considering a major records reorganization for some time but because of the magnitude of the task little progress had been made until 1972 when the proposal to reorganize the structure of local government was made. Some 1,300 authorities were to be compressed into a streamlined organization of 400 new councils. Because of this the VO, serving local authorities, needed to reorganize its own local office structure to match the new authorities—a reduction in numbers from 200 to 174. The proposed closure of 26 offices and the redistribution of records and staff coupled with the ever-growing need to find a solution to the problems of housing the expanding volume of paper gave the necessary impetus for a start to be made.

This article deals firstly with the work which went into the examination of the possible use of a central repository for record storage and secondly, more particularly, with the alternative chosen by the VO—microfilming. In examining the feasibility of using a central repository for record storage regard was made to an earlier Branch Committee report which recommended a repository solution, with the creation of history sheets recording events since 1965 for every file, before the

papers were transferred to a central store. To test this recommendation a pilot scheme was mounted in January 1973 and the results studied and evaluated by May 1973. The indications were that for a typical office there was no prospect of a start being made before April 1974 and that it was impossible to complete the extraction of history from files within the time available. Indeed it was estimated that it could take as long as seven years to complete the reorganization. The Branch O & M team recommended that an alternative should be sought and questioned the feasibility of the central repository recommendation. The requirements seemed to be a 6-acre site with 100 miles of racking, which would increase by 100 linear yards per annum. The cost of manning, maintenance, supervision and the organization of the initial removal of files from 200 local offices presented considerable problems and these were serious enough to raise doubts in the minds of both the MS team and local office management.

To halt the growth of the old filing system, which was based on the principle of a permanent file for every ownership of land throughout the country in 1910, the Branch initially devised a system of case-filing for R & C papers, which was implemented in April 1973. Thus the growth of the old files had been stopped and alternatives to the central repository concept could be considered. It was first necessary to determine the size of the paper problem with some accuracy and samples were taken in 10 local offices. The results showed that an average sized office held about 75,000 old R & C files with an average of 20 pages in each. The estimated Branch holding was, therefore, 300 million pieces of paper housed in 15 million files.

A number of alternatives were considered but the O & M team settled on microfilming as offering the most promising avenue for more detailed study. It was felt that the microfilming of records would provide a modern system eliminating the need for an expensive central repository and effect a considerable saving in floor space in every office in the country—traditional and extensive filing rooms would become a thing of the past. It offered the prospect of keeping records in local offices in a microfilm form thus retaining the advantages of the paper filing system it would replace.

Print-out from microfilm was reasonably easy, up-dating was possible and the records were permanently in clean condition. VO management accepted the recommendation and a Microfilm Project Team was set up in 1973 consisting of Central and Branch (VO) MS staff augmented by CSD and the Co-ordinator of Reprographic Services (HMSO) with their special expertise in the introduction of microfilm systems.

The team's preliminary findings were that although microfilming seemed practicable the amount of material held was so large that even assuming the use of something like 100 cameras it would take several years to transfer the whole of the file contents to film.

It was concluded that microfilming all the old R & C papers was

not practicable and that in any case the archival value of much of the older material was of doubtful or limited value and microfilming all of it could not be justified. VO management were therefore asked to consider these findings and were informed that from research it appeared the *average* file contents could be broken down as follows: 1965 to date (1973), four items; 1950–64, nine items; pre-1950, seven items.

The Branch examined samples of papers originating before 1965 and traditional O & M questions were asked. The Chief Valuer decided that it would be necessary to preserve all papers originating post-1963 but earlier papers could be destroyed. The Public Records Office agreed that, apart from certain papers which Inland Revenue had a statutory obligation to retain, destruction could be undertaken. This decision represented the watershed of the whole review.

The MS team estimated that this would reduce the filming requirement from 300 to 100 million pieces of paper which, with 100 cameras, might well be completed within two years provided that Branch MS could organize a nationwide programme of file stripping and disposal of the 200 million pieces of surplus paper. It may be of passing interest to note that this task went very well and each office disposed of something like 200 sacks of confidential waste, thereby releasing considerable areas of filing room space for use in offices. In some instances this saving, coupled with that from microfilming, made the rehousing of some of the reorganized offices unnecessary.

Pilot study

With CSD and HMSO approval it was agreed that a detailed microfilm study be undertaken in two local valuation offices. The offices chosen were South Shields and Tynemouth, due to merge into a single new Tyneside office in April 1974 on boundary changes resulting from the Local Government Act.

The main purposes of the pilot study were:

(1) To test the use of microfilm records in an actual office environment and to ensure that there were no practical problems in retrieving information via a microfilm record.
(2) To test management and staff reaction to the use of microfilm.
(3) To try alternative types of cameras and microfilm readers, and to compare filming rates in the two offices concerned.

Although the preliminary study had suggested that roll film was the best medium for recording the contents of VO files it was decided that a small trial should also be mounted in parallel, in the Tynemouth office, using roll film inserted into microfilm jackets.

Mindful of the short time span available to complete the task the MS team made detailed estimates of the maximum time it could allow for each office to have its material filmed and with the expert advice of CRS and CSD it was decided to put two cameras into each office and

to man the cameras with existing staff even though the local office commitment to the rest of records reorganization was heavy and file stripping was biting deeply into resources.

Setting up

The local office staff set about recovering all live files and incorporating them into the system in order to guarantee the sequential order of the system ready for filming. This in itself was a time-consuming task. It was necessary to ensure that suitable adequate street identification markers were created for the filming run and that file number orientation was correct for viewing so as to avoid the need to resort to image rotation on the reader.

The equipment was delivered in September 1973—two flow cameras, two planetary cameras, two motorized reader/printers, three hand-wind readers, two motorized readers—all using cartridges or cassettes. One microfilm jacket loader and a microfiche reader were also supplied for use with the microfilm jacket trial.

A printing facility was supplied for the trial because a considerable number of instances had been identified where the case filing system instituted in April 1973 had not yet gathered enough hard copy to provide the necessary background valuation information for Valuers and it would not be economical for Valuers to sit and extract notes while using readers. It was essential to monitor how many, how often and in what cases print-outs were necessary.

Briefing staff on the objectives of the study was considered vital and some time was spent in talking to them. Training for the film camera operators was done locally by the suppliers and by the team. There were teething troubles but a more flexible approach to management proved successful in fostering a co-operative and contented attitude in staff performing a basically monotonous task.

Work started in earnest in October 1973 and by November filming was going relatively smoothly. As both offices were due to move to their new joint accommodation by the end of the year the study imposed a very heavy additional burden on both management and staff. It was very much to their credit, therefore, that they completed filming in both offices by mid-December 1973.

The MS team were heartened by the enthusiastic acceptance of microfilm by staff at all levels thus getting the whole of the study off to a flying start.

Reviewing the results of the pilot study

A short period was allowed for the new system to settle after which a meeting with management and staff of both pilot offices was called to discuss lessons learnt. The first most important piece of information forthcoming was that by and large the transfer of the contents of files to film had raised no fundamental problems in the working situation.

Secondly, a number of plans and maps held in files were in many

instances too large to be filmed so a method had to be devised to record on film the existence of such items. A simple solution was found—each plan was given a sequential number and filed in its numerical sequence in a plan cupboard; a plain sheet of paper was similarly numbered and placed in the correct place in the file to be filmed. Thus on reading the file a clear reference to the map or plan number could be obtained and retrieval accomplished. All large maps and plans are dealt with in this way.

Thirdly, it was found that in many instances correspondence was likely to arise in cases which had been closed and filmed. It was not possible to add to a file content at this stage without splicing the film. This was clearly impracticable and uneconomic and it was therefore decided that all settled R & C files should be kept for one year before transfer to film. This significantly reduced the number of copies required and therefore the requirements for print-out facilities in local offices.

The management and staff of both offices expressed a strong preference for roll film in cartridges, which it was felt gave complete file integrity.

An element of competition between the two offices had been introduced during filming but unfortunately this seemingly innocuous idea rebounded on the organizers who had some difficulty in evaluating the benefits of the two types of camera in use because teams had vied with each other to such a degree that the filming statistics did not give a clear picture in favour of either planetary or flow types. There was some use of the print-out facility and it was clear that though local offices would need access to the facility the requirement was low.

The information obtained from the two offices in the pilot study was not sufficient to justify recommendation for a national scheme and consideration was given to extending the study to the whole of the Northern 1 Region comprising five offices. Time was passing, equipment on a large scale would be required and money was getting short. The solution was to recommend that the study be extended but that the feasibility of filming the whole of the region by establishing a microfilm centre and transporting all the files of each office in turn for filming should be examined. Urgent discussions were held which established that road transport arrangements could be guaranteed for this purpose. The use of a microfilm centre concept also reduced the burden of monitoring on the small MS team available.

As mentioned previously the decision to retain one year's paper had reduced the demand for reader/printers and there was now no question, in the event of a national scheme, of this type of equipment being supplied to all 174 local offices. It could not be justified on a cost-effective basis. What then would be done to ensure that local offices had ready access to print-out facilities? The decision to set up a microfilm centre gave the clue—issue reader/printers on a regional basis (the Branch has 25 regional offices). This had quite a dramatic effect

on the cost of the scheme. It cut requirements from 175 reader/printers to 24. There were dangers however in this decision because it was not felt possible to send the *only* film record from local to regional office for print-out purposes. The solution was to place the silver halide originals at regional offices and permanent diazo copies in the local offices thus offering print-out facilities to local offices and Branch management something it has never previously had—a duplicate system of files for security purposes.

Funds being made available for new projects were under close scrutiny by CSD and the MS team put forward, early in 1974, further proposals summarizing the advantages of a national microfilm programme as follows:

(*a*) The Branch would achieve control of the growth of paper and filing room requirements.
(*b*) There would be a considerable reduction in the amount of time spent in each local office tracing, extracting and replacing files with a consequential saving of staff.
(*c*) Substantial savings of floor space would be realized (estimated at 500 sq. ft. per office) which in many instances would, when taken together with the savings from the destruction policy, obviate the necessity for rehousing.

By now the progress of the new system of case-filing introduced in April 1973 was well advanced and requests were being received from local offices in increasing numbers for priority to be given to the microfilming programme.

In view of the urgent need to resolve the accommodation problems arising from local government reorganization it was agreed that further funds would be made available. These were sufficient to start a microfilm centre at Newcastle and two others at Kew and Bradford. A system for filming the records of local offices in a microfilm centre had now to be devised.

Extending the pilot study using a microfilm centre

The Newcastle microfilm centre came into being in April 1974 and was housed in the filing room of the Newcastle Valuation Office. Control and management of the centre was the responsibility of the Northern Regional Office which, quite fortuitously, was located on the same site.

The transfer of some 75,000 files weighing between 5–6 tons from each office posed a major problem. The traditional methods used in the VO were parcelling, numbering and re-racking pending removal—a time-consuming chore. The problem was surmounted when it was discovered that the Department of Industry used high density plastic containers for a similar task when transferring Company files for microfilming to a centre outside London. Files can be stacked straight into the boxes and when each box is full they can be stacked six high and a 'dolly' inserted under them for removal from the premises. The

empty boxes can be reversed and stacked one inside the other so taking an absolute minimum of space for storage. A slight modification for the addition of a security strap to these boxes was suggested.

By agreement with CSD and HMSO the number of cameras was increased to four planetary and four flow cameras. Staff were recruited for the centre on the basis of one for each camera plus several back-up staff for supervision, file transport to and from the camera operators and cover for absences. Initial output was about 500 pages per hour per operator and this rose steadily to between 700–800 per hour per operator. Even higher rates were achieved by individual operators with particular manipulative skills.

All proceeded smoothly, save for one area. Exposed film was being processed by a commercial film bureau who were also producing duplicate films. The original arrangement made with the bureau relating to the initial pilot study was that turn round of film would be about three days which meant that centres would have to hold files until film had been processed, check the print for clarity and completeness and then arrange for the files to be sent for destruction.

Because of the additional requirement for diazo duplicates the turn round time became extended and this, coupled with postal delays and machine breakdowns, made it obvious that, in any extension of filming to a national scheme, film processing and duplication within the department would have to be considered. By mid-1974 it had been proved that the microfilm centre concept was a viable proposition and planning proceeded for two more centres, one at Kew and one at Bradford. The officers selected to take charge of these centres received training at the Newcastle centre and also went on a commercial microfilm course. The new centres commenced filming in autumn 1974 and were well into their stride by the New Year filming files from offices with accommodation problems.

A nationwide microfilm scheme—yes or no?

By September 1974 the team had amassed sufficient data from the pilot study to prepare proposals for a microfilm programme encompassing all the remaining Valuation Offices in England and Wales.

It was estimated that a further seven centres using eight planetary cameras each would be required to complete filming by late 1976. Their location was influenced by the need to restrict the transportation of files to the minimum distance. Accommodation requirements were a minimum of 2,000 sq. ft. to house cameras, staff and the files being filmed. Good access was necessary for vehicles to load and unload boxes. In locations where it was not possible to obtain ground floor accommodation special arrangements had to be made to use lifts outside office hours to avoid disruption to other occupiers.

In the pilot scheme movement of files between local offices and Newcastle was made on an *ad hoc* basis but such an arrangement was clearly unsuitable for a national scheme. A transport organization with

a countrywide coverage of depots was selected and apart from one or two instances where problems were encountered with porterage of the boxes the collections and deliveries were satisfactory.

Although every centre would require between 400–500 boxes for a limited period of only two years or so the capital cost of purchasing these items (instead of renting) could more than be recouped by using them for normal future office moves within the Inland Revenue once microfilming was complete.

By October 1974 a final report had been prepared complete with full discounted cash flow costings summarizing the results of the pilot study and recommending the extension of microfilming to all local offices in England and Wales. The costings showed that savings over a nine-year period from April 1976 would exceed £4 million. It was also proposed that the film processing and duplication should be undertaken within the department at Kew Centre.

The recommendations were accepted by the Chief Valuer and the Board of Inland Revenue. CSD financial approval was given and most of the remaining centres were established and operational by June 1975. The country was covered by nine centres instead of the projected ten and a total of 76 planetary cameras was employed.

Selection of microfilm equipment

The trial of the two types of camera at the Newcastle centre had enabled their suitability to be tested by direct comparison since the operators alternated from type to type, taking turns at the different cameras. As output figures were accumulated it was found that the flow camera was slightly faster, although it was more liable to breakdown. It was necessary to film the manila file covers and there was difficulty in feeding these through the rollers without some jamming of the feed mechanism. Modifications were made to the feed but it was found that this problem could be reduced by cutting off the front file covers and feeding them into the camera throat short end first. This was labour-intensive and costly.

In addition the ergonomic design of the cameras was such that the operators found it uncomfortable to sit at the machines continuously even though they had been provided with adjustable chairs. Most of the operators resorted to standing for the greater part of the day which was extremely tiring.

The planetary camera presented no problems of this kind and in fact the operators expressed a liking for it on the grounds that they had control over their filming rates. These cameras are designed to rest on tables and with an adjustable chair could be operated comfortably all day. The handwind reader was rejected by all users, all expressing a firm preference for a motorized reader with automatic cartridge loading using an odometer to measure film travel out of the cartridge. Retrieval statistics indicated that in the majority of offices one such reader would be sufficient.

Reader/printers of a similar type were preferred for regional offices but because of the limited use to be made of the original silver halide film these could be housed on open reels.

A total of 24 reader/printers and 284 microfilm readers are in use in regional and local Valuation Offices. Storage of the film cartridges is in steel storage cabinets with drawers and these are housed adjacent to the readers.

Finale

Work on filming the old files will be completed by the winter of 1976. It will have taken three and a half years from inception to completion of the Valuation Office microfilming programme and the whole of the VO records reorganization is well under way. Work on an annual up-dating film programme covering case files set up since April 1973 is already in hand.

The authors are conscious that, without the support of their former colleagues in the Project Team—particularly Jim Scott now with the Civil Service College and David Curtis, Co-ordinator of Filing Services, Inland Revenue, who did much of the original research—and the wholehearted co-operation of senior management within the VO and management and staff in the pilot offices, the project would never have come successfully to fruition.

Computers for People—Designing 'Human' Systems

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Introduction

In recent years there has been a growing interest both inside and outside the Civil Service in the impact of computerized work processes on staff. This interest is particularly strong at the present time with the growth in 'on-line' computer applications. The days when one could assume that the only problems to be overcome were technical, systems-design problems are long gone. Whereas batch processing often involves either recruiting specialist staff, or retraining staff to take on completely new tasks, on-line systems tend to affect staff in their existing jobs. The 'match' between the needs of the staff in post on the one hand and the requirements from the staff of the computer system on the other has, therefore, to be carefully considered.

BSRD has been increasingly involved in this area of work in the past two years. We have provided some direct assistance to Inland Revenue, MOD and DHSS on computer implementation and evaluation, and on the basis of this experience we feel that there are a number of general points which managers should bear in mind concerning the human factors which may determine the success or failure of a computer project. This article, therefore, sets out what we have learnt about the kinds of 'people' problems which may occur when implementing a computerized work system, the ways in which 'human' factors can be taken into account in order to avoid such problems; and suggests some general points of principle which managers should bear in mind when embarking upon a programme of computerization.

Kinds of problems which may occur

Little attention is normally paid to the way in which people behave when dealing with a computer system; yet the acceptance of the system by its operators and users is crucial to the efficient working of the system and the achievement of its objectives. The system will become

less than fully effective if the needs and informal procedures of the operators are not taken into account. Organizations do not always acknowledge these needs and procedures. A good system will meet the personal and social needs of the staff as well as enabling the work to be done according to the rules and requirements of the organization. A poorly designed system prescribes the way people and machines ought to behave rather than takes into account the way people actually do behave. The following two examples illustrate how systems may become less effective when human and social needs are not recognized.

In a hospital, a computerized Pathology Laboratory request system was installed. In this system a machine on the ward would accept requests for a test to be carried out, and display the results of the test when they were 'called up'. The main purpose of the system was to save doctors' valuable time in 'chasing up' and collecting test results. However, when the new system was introduced it was not at all as popular as expected—especially not with the junior doctors. It seems that during their very long shifts, whenever they needed to take a break and slip away from the wards, the doctors would go to the Pathology Laboratory to check up on test results. With the new system this was no longer a valid reason, but it is expected that they have discovered another one, and that the expected savings in staff time will not have been realized.

We all take short cuts in our work methods and sometimes fall back on 'informal' procedures. A good technical system should recognize this. Our second example, also from a hospital context, is of a computer system which did not take into account the informal practices of its 'peripheral' users. GPs were required to send written referrals to the hospital giving basic patient identification information (a special form had been devised for this). Given 24 hours' notice, this information was given to the computer and the patient was automatically allocated the earliest available appointment and put on a clinic list; labels, folders and lists were automatically produced for the clinic and case notes collected in advance. However, some GPs preferred to telephone the consultants personally and discuss their patients, and send them along directly, thus in effect by-passing the computerized system. Because of this the whole appointment list could be upset, clinics ran overtime, some patients jumped the queue, case notes were not always available, and last-minute tests and X-rays were needed.

Such problems can be avoided or minimized if the computer system is viewed as a man/machine system and not just a technical system. Specifically, this means planning for and designing for human needs as part of the computerization process. Such needs should be considered at both the design and implementation stages.

Planning man/machine systems

Design

From the very outset the systems team as well as managers themselves

need to be aware of the human factors to be taken into account in their particular organization. Any organization operates on two levels: the formal level which corresponds roughly to the organization chart in most situations, and the informal level. The informal organization is never seen on paper, but represents the many ways in which the organization really operates, very often despite the formal organization chart. Informal groupings, channels of communication and ways of working all form part of this informal organization which will have become established through the custom and practice of work groups over many years. A technological change strategy which ignores such custom and practice does so at its peril. If the system is designed only to meet the needs of formal ways of working it will cut across these informal arrangements which may well be as effective, and more suited to the needs of the staff themselves in carrying out the work. In such a situation the human response may be either to 'reject' the system (overtly or covertly) or to circumvent the system, thereby recreating the old informal practices. We are not saying here that informal systems must always be preserved, but rather that they should be examined and an assessment made as to how far they may be affected, what the consequences are likely to be, and how they can be catered for within the new computer system.

Also at the design stage, some consideration must be given to the way in which day-to-day supervision is normally carried out. Management practices vary considerably, for example, some managers may rely on paper communication only to monitor and supervise their staff, whereas others spend a good deal of time talking to staff and observing them carrying out their duties. The way in which supervision is carried out may depend on a number of factors including the existing technology and even office layout, as well as the inclination of both manager and subordinate. The systems design, however, needs to take account of the managerial relationships that exist, and to provide a technology which will enable effective monitoring and supervision to be carried out in a way that will meet the requirements of both manager and managed. If the basis of supervision, for instance, needs to be changed in the new system, the consequences of such a change must be taken into account. Similarly, if a technological change is to be introduced which will only affect one working level directly, it is important to ensure that the managers of this group are not isolated from it, or impeded in their management duties by lack of knowledge of the new technology.

Staff often feel that it is going to be an enormous task to learn to cope with a new system. However, they are infinitely adaptable; they can learn and never stop learning. Computer systems rarely take this into account but are designed to be no more complex than staff can cope with at the implementation stage. In order to increase efficiency, designers aim to reduce the variation in a task, defining the kinds of information to be dealt with and limiting the responses of the staff. In this way they can reduce the likelihood of errors, simplify staff training,

limit the amount of information to be stored, and speed up individual work processes. However, it is the elements of variety and judgement which make work satisfying. Flexible, adaptable systems will be able to take on more and varied work as the staff become able to do so.

The impact of the computer on particular jobs, therefore, must be taken into account when designing a system. This is particularly relevant where an on-line system is being introduced into an existing working group. Particular attention needs to be paid to the sources of satisfaction and dissatisfaction for staff in their pre-computer jobs. These will be many and varied, and to some extent will rely on the predisposition of the staff. However, studies have shown that in any job there is usually a 'core' of such factors which obtain for the whole group doing that particular job. As far as possible the introduction of a new technology should ensure that the existing sources of satisfaction are built into the new job, while the sources of dissatisfaction are not. This is often crucial to the successful implementation of a new system.

It is important to remember that the sources of satisfaction/dissatisfaction are not always apparent, and designers and managers may make the wrong assumptions. The difficulty is that these assumptions are only seen to be wrong when it is too late, and the system is operating. The mistakes can be costly in terms of staff wastage, increased absence and sickness, as well as low operating effectiveness. Such mistakes can sometimes be avoided simply by using a check-list approach, e.g. does the system provide adequate operational benefits in return for the data inputting required? Does the system give staff sufficient 'job discretion'? Does the system give staff sufficient job control? Does the system meet the needs of staff for the normal logical thinking stages or does it merely require a 'data-input machine'?

There are other ways of ensuring that the main sources of job satisfaction are taken into account. These involve staff directly in design. One way of doing this is to ask staff to fill in questionnaires in advance of computerization on the factors affecting job satisfaction and then to 'feed' the results to the systems design team. Another is to hold group discussions with the staff to be affected, with a view to their participation in design. Such methods are described by E. M. Mumford in 'A Strategy for the Redesign of Work', *Personnel Review* (Spring 1976). It is also important that staff associations are involved in this stage of computerization. As well as having an acknowledged interest in questions such as the effects of computerization on pay and conditions, staff associations can play a useful part in helping to create computer systems which will meet the job needs of their members. They should, therefore, be involved as early as possible in discussions about design.

Also during the design stage it will be necessary to consider ergonomic factors. These encompass the physical characteristics of the equipment which staff will have to use, the quality of displays, lighting, ventilation, and office furniture, and how people react to them. The efficiency and effectiveness of the computer system will be influenced

by such factors and they should be carefully reviewed. A body of knowledge is now being built up on such factors and many sources are available, e.g. 'Man-Computer Interaction: a Review of Ergonomics Literature and Related Research', B. Shackel and P. Shipley, *EMI Electronics*, 1970.

There are several different ways in which data can be put in the computer and produced as output. These different information media include punched-cards, print-outs, *pro forma* and visual displays. The choice of information medium is crucial: it will largely determine the available alternatives for organizing the work, for patterns of supervision, for checking procedures, for accessing information and for physical layout. Therefore, managers need to be involved in decisions of this kind. The way in which data are produced for other users, or 'clients', will also be of importance, e.g. in 'sensitive' fields such as medicine and taxation, punched-cards or print-outs may not be acceptable.

Implementation

In any work situation the implementation of a technological change requires considerable forethought and planning. This is, perhaps, particularly the case with computerization, because of the inbuilt fears and apprehensions which many people have about computers. Many such fears will, however, have been alleviated if the staff have already been involved in the design stages.

It is equally important during the post-design period, that the staff to be affected are not 'left out in the cold', learning the details of computerization only when the machinery is actually delivered. Staff may undergo months of anxiety unnecessarily and attitudes against computerization may harden in such a situation. A two-way communication link needs to be established between the staff and the computer specialists or systems team. This will ensure that the staff are kept informed of developments, and that the team know about any perceived difficulties on the part of the staff. These links should be informal, open to both sides, and as direct as possible. Two methods which have been tried in Inland Revenue are a regular newsletter put out to the staff by the systems team, and an 'open day' at the computer centre, where staff from each of the offices to be affected by computerization could come along, see the computer, meet the team and try out the visual display units which they would eventually be using.

Running parallel to such activities should be close discussions between the systems team, managers and staff associations, on the wider implications of the system and the training and implementation timetables. Effective training of new users will be a crucial part of implementation. Planning needs to be done well in advance, and the contingencies of the work taken into account. Staff need to be given an adequate chance during training to 'explore the boundaries' of the system, that is to see how far it will allow them to carry out certain

procedures. Managers may also need training even if they will not necessarily be directly involved in the operation of the system. They need to be at least as fully informed of the technicalities of the system as the staff they manage; and may need to learn how to manage a technological change of this kind.

Of particular importance in this respect is the managerial style adopted during the implementation stage. It has been shown elsewhere (Burns and Stalker, *Management of Innovation*, 1961), that technological change is most easily achieved in those organizations which have an 'organic' as opposed to a 'mechanistic' managerial style. That is, technological change will be most successful where formal bureaucratic procedures are at a minimum and where lines of communication are always open between a number of levels in the hierarchy. We have found that the implementation phase has been most successful where organizations have dispensed with tight monitoring and control systems, where managers have encouraged staff to admit mistakes, and provided support and help rather than sanctions. This may require a change in management style during implementation, and managers may find this an uneasy prospect. Such a change does not mean that work standards must be lowered, however, but rather that the managerial role in achieving those work standards will be different. Instead of staff working to a predetermined standard and being seen as having failed if they do not match it, managers and staff will work together to achieve the standard, with the possibility for mistakes being accepted.

A problem often encountered in implementation is the extent to which a 'fall-back' system should be provided, so that if the equipment fails for any reason, staff can switch over to a manual or other system. Managers sometimes provide only a minimal fall-back system fearing that staff will otherwise be tempted to use this instead of the computerized system and thus will not become accustomed to the computer system. However, such fears are often ill-founded. If the system has been designed with benefits to the user in mind, as suggested above, then the motivation to use it should come, to some extent, from the staff themselves.

If, on the other hand, the principles so far outlined are not adhered to, and the system tends to reduce satisfaction, staff may well create their own 'secondary system'. Such secondary systems supplement the new system rather than replace it, they include the keeping of personal notebooks and the unnecessary writing out of data input forms in rough form. These practices often slow up work and mean the staff are doing more work than they need to do, and managers should watch out for this during the implementation phase. Their occurrence may reflect either short-comings in the system (e.g. it doesn't follow the logical thought patterns of the operators) or an inappropriate management style causing staff to be far too concerned about making mistakes during implementation. One case has been reported to us, in a batch processing system, where work had been previously carried out

manually using pre-printed forms. The staff in this case sent for bundles of these pre-printed forms from colleagues in non-computerized locations some miles away in order to work out certain calculations which the computer did not itemize on the print-out. The appropriate response here is not simply to deprive staff of the means of doing the job by another method, but to determine what is wrong with a system where staff will go to such lengths to secure a secondary system of this kind.

Similarly, if a computer system requires a considerable amount of effort to be spent on data preparation, with a number of levels of checking before data input, the systems team might ask themselves whether an adjustment of the format for data input, or whether re-programming, could alleviate this.

It is vital in the implementation phase that computer breakdowns are kept to a minimum and maintenance is carried out speedily, if staff are to become committed to and confident in the new way of working. Otherwise, staff may devote undue time and effort to maintaining the fall-back system or establishing and developing secondary systems of their own to tide them over the breakdowns. Even when the computer machinery becomes more reliable, staff may cling to such 'stop-gap' measures.

On-going system and its development

Ensuring the effectiveness of a computer system is a continuing process which goes beyond the earliest and more active part of the implementation phase. It is incumbent upon the designer to build in sufficient flexibility to allow the system to be changed as the objectives of the organization change and as user-needs change, but it is the manager's job to continually review the service it offers and to relate this to his needs and the needs of his staff. If the computer cannot supply new and wanted information then the user will go elsewhere or develop additional work procedures. If this happens too often the staff may begin to rely on alternative procedures and will pay less attention to the quality of their data input to the computer and may stop using the computer altogether when they can. It is necessary, therefore, to provide some long-term user service which can develop new facilities to keep the computer system in step with the users' needs.

A key method for motivating staff to maintain high standards of work once the computer system is installed is to make them responsible for correcting their own errors. This becomes especially important where input is not handwritten and is not identifiable and where one person's input may be used by many others. 'In store' data are usually prone to some degree of error or erasure, and to safeguard them many systems do not allow operators to correct their own errors but require them to fill in a form which is sent to somebody else—usually a computer technician or supervisor—for action. Unfortunately, this will sometimes reduce the overall accuracy even further because of operators'

reluctance to admit their mistakes to supervisors by filling in error forms. Safeguards of this kind also create additional problems if there is delay between the operator identifying a mistake and it being put right. Operators then know they may be using inaccurate, uncorrected data and take less care themselves.

It is often only after the computer is in operation that inadequacies in matching the technical system and the management/supervisory systems become apparent. The solution to such problems is often regarded as a technical one, and the temptation is to seek complex, rigid technical solutions rather than to try to influence the way the staff are motivated and the way they behave. The need to look at both technical and supervisory solutions to problems of this kind can be illustrated by the following example.

At one hospital appointments section, where visual display units (VDUs) were used, there was a telephone at hand for the clerk to get a supervisor's authority for non-routine input. One clerk got into a muddle when making a non-routine input to the VDU. She did not telephone her supervisor but by deliberately typing five errors she found a way out of the fix, and in doing so spoiled the records. It took the systems analyst one and a half days to work out how the records had been spoiled. The analyst's solution was that he should write a new, tighter program, i.e. provide a technical solution. The question that should have been asked was why didn't the clerk call her supervisor for help? And what was wrong with the supervisor/subordinate relations, i.e. could a supervisory solution have been found?

There may be a number of alternative solutions to apparently technical problems. These might include changes in styles of supervision, changes in the pattern of rewards and incentives, new criteria for recruitment and selection of staff, changes in training, or different work-checking procedures.

Contribution of social scientists

So far, we have pointed out some of the problems and difficulties which may bedevil on-line computer systems, and have suggested ways in which these might be anticipated and possibly forestalled. Social scientists can also provide direct assistance to managers and systems designers, using such methods as interviews, questionnaires, group discussions and activity analysis.

In the design stage, they can draw on theories of motivation and behaviour to highlight the problems which may arise from conflict between organizational aims, objectives and needs, and those of the individual, which may impair the effectiveness of the system and reduce job satisfaction. To help identify and measure the factors which affect job satisfaction, social scientists have developed a range of techniques which have been applied to the design of man/machine systems. Such techniques include job analysis which will isolate key job-variables—such as task interdependence, work-flow, degree of specialization,

checking procedures and supervisory controls (cf. R. Atkin: 'The Reservations Clerk and the Computer' in the *Training Research Bulletin*, Volume 4, Number 2).

Further help can be given during the implementation stage. For example, profiles of the skills required for specific jobs can be produced and appropriate programmes for staff selection and training developed. As the implementation gets under way, social scientists will also be able to provide assistance to the computer team in assessing its initial impact on staff, and the need for any immediate adjustments.

Finally, the measurement of factors affecting job satisfaction and the identification of work processes and styles of supervision can also provide the basis for evaluating the impact of the computer system on operators and users. This will enable comparisons to be made between the old system and the new computer system.

Conclusions

It may be useful here to summarize the main points which we have raised and which managers might usefully bear in mind when beginning to plan computerization:

(1) Failure to take into account the human side and the man/machine system at all stages of computerization may result in reduced effectiveness and costly mistakes.
(2) Systems design and implementation needs to be participative, with managers able to influence the key design decisions and with the staff and their staff associations fully involved.
(3) Where computer systems will impact upon people already in jobs the sources of job satisfaction and dissatisfaction under the present system need to be taken into account at the design stage.
(4) Personnel and managerial policies need to be examined and perhaps redesigned to match the computer system. Supervisory and control systems may have to be revised—especially during the implementation phase.
(5) The involvement of staff needs to be carried over to the implementation phase, with a two-way communication link between staff and the computer team.
(6) Systems should be designed so that they do not rely totally on checking and supervision to work effectively, but provide staff with sufficient reason to use them to the full.
(7) Evaluation of the impact of the system needs to be planned well in advance so that the main features of the old system can be assessed and compared with those of the new computer system.
(8) There are ways in which social scientists can provide direct assistance to managers and systems designers during the design, implementation and evaluation stages of computerization.

Self Instruction in the Civil Service

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Keith Ball is a Training Liaison Officer with the Personnel Management (Training) Division of CSD. He was Chairman of a sub-committee of the interdepartmental Programmed Learning Working Group charged with producing a short paper for general issue to outline the practical implications of self instruction in the Civil Service. In this he was ably assisted by Miss Susan Grimstead formerly of PM(T) Division. The following article is a very slight adaptation of the original paper, enquiries about which may be addressed to the Civil Service Department (PM(T)), Room 3/59, Old Admiralty Building, Whitehall, London SW1A 2AZ. —*Editor.*

Introduction

As a training method, self instruction has been used in Government Departments since 1964. But self instruction can be interpreted in a very broad way. However, for the purposes of this article, self instruction is defined as a method by which a person can learn effectively, on his own and at his own pace, either a skill or knowledge or a combination of both to a predetermined standard which he can then perform/apply under normal working conditions.

Methods

The principal means of self instruction used in the Civil Service are job aids, check lists, algorithms, programmed texts, teaching machines and audio visual media.

Job aids are produced for specific jobs for use while performing that task. They tell the trainee how to do the job and show examples.

Check lists are simple 'reminders' for action.

An *algorithm* is an orderly sequence of instructions for solving a problem and/or carrying out a work process. It can be either in (*a*) diagrammatic or (*b*) list form:

(*a*) The diagrammatic form of algorithm is also known as a logical tree. Basically it is a sequence of simple questions progressing from the most general to the specific in such a way that only those which are relevant need to be read and answered. Usually the questions are encased in boxes and require a 'yes' or 'no' answer to direct the reader to the next appropriate box by an arrowed line. In this manner the reader is led to a correct answer to his problem.

(*b*) The list structure form of algorithm is an ordered list of questions, responses and instructions. It is, in effect, a logical tree without the boxes and lines. Identical information can be conveyed by a list

structure as by a diagrammatic algorithm and the choice of format is often dictated by the space available.

Programmed texts are structured to achieve a specific objective. The skills or knowledge to be taught are presented in a logical sequence which helps the trainee to learn all the necessary material. At each stage he is given specific information to which a response must be made. Correct answers or conclusions are reinforced and allow progression through the programme, continuously involving the trainee in the learning process. On completion, the trainee is asked either to practise the task or apply the knowledge gained, thus reinforcing the learning in a practical way.

Teaching machines usually display programmes which embody the same principles as those found in programmed texts. Such programmes are synchronized for presentation and activated by the trainee, but their format may vary from sheets of paper or card to paper rolls, film or microfilm. The machines may be simple hand-operated devices or electronically controlled.

Audio visual techniques are used to present material in a number of ways using a combination of some of the following: tape recorder, slide projector, film strips, video tape and monitor, supported by cards or work books and practical work. Research is in progress using computers.

Audio visual material used for self-instructional purposes is structured to enable trainees to participate fully and respond in a positive manner. Work books are usually provided to ensure this and also to help reinforce visual material. Any self correction necessary can be made at regular intervals throughout the learning period.

Successful use of self instruction

Examples where self instruction has been used successfully include the following:

(*a*) To train a large number of widely scattered staff in a short period. A typical instance was when a new system of classification was adopted in a department and it had to be implemented by all staff on the same date although the time available for training was limited.

(*b*) To train staff in various departments in the decimalization of currency.

(*c*) Where uniformity was essential. A good example is the programmed textbook and supporting material used to train 150,000 officers in the new Service-wide staff reporting system.

(*d*) To train staff in 900 local offices of the Department of Employment in the procedure for the payment of unemployment benefit.

(*e*) To complement formal courses. Programmed texts have been used successfully in conjunction with formal training for new entrant Clerical Officers.

(*f*) To provide training for staff moving to new duties. An instance was

in local offices of a department where staff moved between three different categories of work which were interrelated but each demanded a separate range of knowledge and skills.

(*g*) Where training was needed before staff could be given places on formal courses. Self instruction has provided initial training to new entrants in a department when, because of high turnover, large numbers were being recruited and training centres were unable to cope immediately with the demand for places on formal courses.

In addition, programmed texts have been used to give new Executive Officers in some departments an outline of their supervisory function when they first took up their posts. Self instruction has also been used successfully for training staff in departmental routine procedures such as checking benefit claims, writing Giro cheques, data preparation, registration and finance work. Other subjects including basic physics, computer language, effective writing, basic mathematics, statistics, languages and plan drawing have also been taught by this method.

Special considerations

Motivation

Because the trainee is not directly motivated to learn by another person (e.g. trainer) the manager must rely on the self-instructional material itself, and the attitudes of people supervising such instruction, to motivate the trainee. In ensuring that the trainee is sufficiently well motivated to learn by self instruction the following points should be considered.

If the trainee wants to be able to do well the job he will be asked to do, or apply the knowledge, an initial motivation will be present to help him learn by any method he thinks will teach him effectively. If self instruction is already a well used method of training in the department, the trainee will be able to judge the effectiveness of the method by the degree of success attained by colleagues who have learned tasks by this technique.

Given that line management has faith in the technique and a genuine interest in the trainee, the trainee is likely to make full use of the material as a method of study. Alternatively, if the person controlling the training hands over the material with obvious scepticism, half heartedness, or perhaps an oppressive authoritarian attitude, the trainee will not be highly motivated to extract the benefits it has to offer.

Relevance and presentation

Regarding the material itself, the relevance of its content, its structure and the quality of its presentation will affect a trainee's motivation to learn. The following points are important to keep in mind.

A manager should ascertain the relevance of the material to the needs of the particular trainee before he asks him to commence work on it.

Any self-instructional package should always state the objective(s) that will be achieved by the trainee after he has worked through it.

Knowing what he will be able to do on completion assists his motivation. Once the trainee has begun, his interest and involvement in the content of the material will also affect his motivation.

Because self instruction is designed to allow the trainee to learn in stages, reinforcing his correct responses, the trainee is likely to progress through the learning pattern more easily than if the teaching were less well structured and this ease of progression usually aids motivation.

A considerable aid to motivation is good presentation. Great care is usually taken by the producers of self-instructional material to ensure that it is attractive in design, layout and colour (if this is used) to stimulate and hold the trainee's attention.

Administration

The administration of self instruction can also influence the trainee's motivation. For example, if a programme has 20 parts which are all given to the trainee at once, no matter how attractively they are presented, they will seem a daunting prospect. It is important that the trainee is briefed on what his job will consist of in its entirety, and of the total number of tasks he will need to master eventually. The sequence and issue of material should be arranged with care so that at no time is the trainee swamped.

Environment

An environment conducive to learning is extremely important and much of the responsibility for ensuring that one exists rests with line management. Ideally this environment should be a quiet comfortable corner or room where the trainee can work alone (but without feeling isolated) at his own pace and without the distraction of telephone calls, interruptions, or distractions which arise when he sees others working faster or slower than he. The trainee needs a higher degree of concentration when working through self-instructional material than if he were in a classroom, and this must be recognized by all concerned with its implementation.

Individual responsibility

Apart from these external considerations some responsibility for learning must rest with the trainee. He will need to use self-discipline and be able to integrate training with job performance.

Divergent or creative thinking

Self instruction is often used to teach set procedures where specific objectives must be reached. Only one 'right' answer is then required. However, in some areas, e.g. management training, where the subject is open to various valid interpretations, the use of creative thinking may need to be encouraged. Self instruction can then be used as part of a larger training programme where issues, not covered by it, can be dealt with by a tutor in a discussion session. Self instruction can,

however, allow for a certain amount of divergent or creative thinking by the trainee. For example, some programmes, by offering a variety of acceptable solutions, encourage the trainee to think independently and so does 'discovery learning' which prescribes that answers to problems may be given, but in which the rules and principles of the problems must be discovered by the trainee.

Competition

A trainee is likely to learn more effectively without open competition if he is introspective or shy in which case his potential may be diminished by such competition, or if, as often happens, he over-estimates the amount of work his counterparts are doing because he cannot see them. In which case he will try harder when working alone than he would do were he able to gauge more accurately the strength of his opponents (or lack of it) in the classroom.

However, lack of open competition may be a disadvantage with younger trainees who have often been found to work faster and better in open competition. A young trainee working alone may be tempted to slow down and not concentrate properly, or may become bored. He may even feel isolated or insecure. But it is the responsibility of his line manager and the people around him to make sure this does not happen.

Self instruction can be unsuitable as the only training method for certain subjects where discussion is essential. In these circumstances self instruction may be used as preparation to a discussion group or to give the necessary background knowledge needed for the discussion.

Supervision

One of the fundamental advantages of self instruction is that a skilled trainer is not required to help the trainee who will generally need little overall supervision. Instructions for working through the material will be given at the beginning and usually any self-instructional package is self contained. However, the responsibility for training is not divorced from line management by the introduction of self-instructional techniques, and the supervisor will need to guide and support the trainee on occasions. He should be ready to answer occasional questions, and provide encouragement and reassurance from time to time.

The amount of supervision required will depend on both the trainee and the subject being learned. Some trainees need more supervision than others and some subjects may need greater supervision of trainees. There may be aspects which need permission before a task can be carried out, or the trainee may need to know where things are kept, etc. Before the trainee begins to work through self-instructional material a supervisor may need to explain to him how it should be used, what he will learn by going through it and where to go with any problems which might possibly arise. After the trainee has completed the relevant training the supervisor may need to discuss it with him and give any post test or make any check necessary to ensure the trainee has reached the acceptable standard.

Measurement of learning

There are three principal ways of measuring the success of a trainee's learning. The first is by a post test. The success of a trainee's learning can be measured by his performance in tests included in some self-instructional packages. These indicate the level of performance the trainee should be able to offer when doing the task for which he is being trained. However, they usually only measure short-term retention (i.e. what the trainee has learned immediately after working through the package) or at most medium-term retention.

The second is by performance on the job. To test longer-term retention the trainee's learning must be measured by his performance on the job. To be fair to the trainee, his success should be measured against the standards specified in the learning objective. Ideally such standards should be agreed with line management before the package is prepared, but precise specifications are not always possible because of changes in the operational situation in which less or more detailed attention is required as the unpredictable work flow demands. Nor should line managers expect self-instructional material to teach the trainee speed or experience, both of which will come with time and practice on the job.

The third principal way of measuring success is by the trainee himself. Producers of self-instructional material may literally specify what they require the trainee to be able to do when he has completed the package. If such a specification is produced against which the trainee can measure his own performance he will then know if he is doing the task or applying the knowledge effectively.

Production

A number of departments employ staff selected to produce self-instructional material. Often these people work in a team under the direction of the Departmental Training Officer. In this category we normally find career civil servants chosen for their personal abilities and who are then trained. At the unsophisticated end of the scale we find line managers who have been trained to produce their own simple work aids.

Once it has been established that there is a training need which can best be met by self instruction, the subject-matter of the potential programme is carefully researched. Much of what follows refers to programmed instruction but in general the basic principles apply to other forms of self-instructional material. Before embarking on any major project, a feasibility study is conducted by some departments to ensure that self instruction is the best way of meeting the training needs in question. It is also confirmed that the people who are going to be taught by this method are sufficient in number or the task is of sufficient importance to justify the time and money to be spent.

Jobs on which the trainees will ultimately be engaged are analysed. Relevant data are collected and checked and advice is sought from

policy and other divisions to ensure the technical accuracy of the programme's content. The objectives of the programme are then defined. Such objectives include:

(*a*) What the trainee needs to know and be able to do.
(*b*) To what standards.
(*c*) Under what conditions he will apply knowledge or perform his new skill.

Teaching points are then clarified in preparation for the actual writing.

Early developmental tests are made of the initial draft programme to ensure that unwarranted assumptions are not made about the level at which the material should be produced. These are usually carried out on a small number of the target population (that is the people for whom the programme has been devised) and where possible the writer is usually present. As a result the writer is able to adjust the level, method and order of presentation of his material if necessary.

When the material is in its final form but before multiple copies are made and distributed, it is validated by a relevant sample of trainees who are all members of the target population. These trainees work through the material as instructed and are tested to find out if the objectives have been met. Others who are likely to be interested are often invited to see the material and make constructive comments. Thus any necessary changes can be made to the final material before issue.

Validation is a continuous process and all self-instructional material is evaluated and up-dated from time to time to ensure its contemporary relevance and effectiveness. In many cases amendments are made and issued at intervals and these are usually of the type that can be inserted into the material. In other cases it has been found cheaper to produce the material afresh should sufficient changes have taken place.

If self-instructional material fails to meet its objective it can be for one of the following reasons:

(*a*) Inadequate analysis of the training need.
(*b*) Inadequate developmental testing and validation of material.
(*c*) Poor presentation of the material so that the trainee lacks motivation.
(*d*) Use of language that is beyond the learning experience of the trainee.
(*e*) Failure to evaluate the learning process and the retention of skills.
(*f*) Poorly defined objectives.
(*g*) Weak structuring.

These problems can be eradicated if the necessary resources and support are available throughout.

Cost

The problem of comparative costing between self-instructional techniques and conventional training techniques though under active

consideration has not yet been resolved; but it is clear that economies of scale exist when effective learning material can be produced centrally by a handful of people for a very large target population.

The assessment of component material costs such as those incurred for printing work undertaken by HMSO or for the purchase of equipment such as cassette tape players or recorders presents no difficulty.

But effective comparison is hampered by the many variables which exist. Instances are the relative experience of programme writers, ease of access to necessary information, firmness of policy decisions, stability of subject-matter, size and experience of target population, extent of research required, media to be used and degree of trainee effectiveness required.

Because of these flexible differences precise costing figures relating to any specific situation are not likely to be universally applicable.

The future for self instruction

At a time of economic stringency it is particularly important that training is made to yield substantial returns in improved job performance. Training needs are unlikely to diminish and it will be important to make the fullest use of the resources available for the training function. In such a situation, consideration must always be given to the alternative ways of satisfying a training need. In some circumstances self instruction might prove more advantageous than conventional training; for instance 'sitting next to Nellie' is very expensive in the use of manpower.

Self-instructional material lends itself to the development of learning resource units or centres where people can learn what they need when they need it. Interest is growing within the Service in such developments because, in certain circumstances, greater economies can be made in the use of resources without dilution of effectiveness.

If properly used self instruction can be a considerable aid to productivity and increase the efficiency and interest of staff.

Centralization of Government Training Centre Stores—An O & M Approach

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Introduction

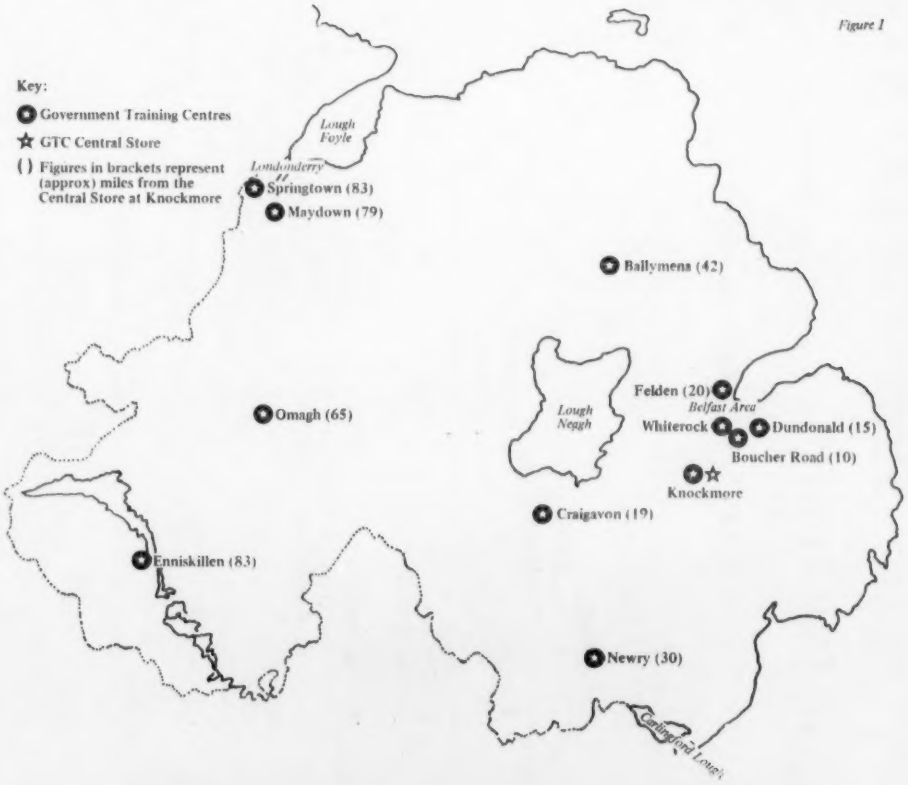
This article describes the first stage of an assignment leading to the eventual computerization of some aspects of supplies to Government Training Centres (GTCs). It illustrates the need to look carefully at the whole organization and associated systems before attempting to introduce computerization. The article is concerned, therefore, with a description of the process leading to stores centralization paving the way for eventual computerization.

Background

Northern Ireland has always experienced a higher rate of unemployment than most other parts of the United Kingdom and the need to attract industry to the Province has been recognized for many years. One means of attracting outside industrial investment is to create a pool of skilled labour which is ready for productive engagement as the opportunity occurs. With this objective in view the first Government Training Centre in Northern Ireland was established at Felden near Belfast in 1945.

The success of this development led to demands for the establishment of more Centres until the present day when the Department of Manpower Services is responsible for the operation of 12 main Centres, four in Belfast, two in Londonderry and one at each of the following: Ballymena, Craigavon, Enniskillen, Lisburn, Newry and Omagh (see *Figure 1*). The Centres have a total direct training staff of approximately 47 Chief Instructors and 412 Instructors, with 1,700 training places for first-year apprentices mainly in engineering and construction trades and 1,050 places for adult trainees mainly in engineering skills but also including some basic construction and traditionally female orientated courses.

Figure 1


Key:
Government Training Centres
GTC Central Store
( ) Figures in brackets represent (approx) miles from the Central Store at Knockmore
Lough Foyle
Londonderry
Springtown (83)
Maydown (79)
Ballymena (42)
Omagh (65)
Lough Neagh
Felden (20)
Belfast Area
Whiterock
Dundonald (15)
Boucher Road (10)
Knockmore
Craigavon (19)
Enniskillen (83)
Newry (30)
Carlingford Lough

The supply organization for the Centres comprises a central purchasing branch with 60 clerical and administrative staff, a central holding store with four industrial staff and a store in each Centre with a total of 15 clerical and 43 industrial staff in all Centres. The annual value of purchases is approximately £1,293,700.

The Purchasing Branch is responsible for all purchasing with the exception of some restricted local purchases—limit £10 per item—invoice checking, maintaining stock records and regular inspection for all stores. The Holding Store is mainly used for spare and surplus machines and materials. GTC stores are responsible for the receipt, holding and issue of all store materials including all documentation relating thereto, the maintenance of stock records and originating all orders for supplies. The number of stock items in stores varies between Centres but averages about 4,000 per store from a total range of some 9,000 items.

The approach

At all stages of the assignment there were two overriding considerations:

(*a*) Training must continue and not be inhibited by the activities of the assignment team.

(*b*) Stores are a service function and irrespective of changes in systems, organizations, etc, they should always be related to the needs of the instructors on the shop floor.

With these considerations in mind a GTC was selected which was considered to be representative and where most of the problems likely to be encountered in relation to stores and supplies would be found. The Centre selected was at Newry, a comparatively new 300-place GTC with a mainly industrial stores staff. It is relatively remote from Belfast and by reason of its location tends to be unpopular with some suppliers. The Centre Manager, Assistant Manager, Chief Instructors, other Instructors and the complete stores staff were interviewed. In addition, the stores procedures and day-to-day operations were examined in detail both in the stores and on the shop floor. The conclusions which were derived from these activities were validated by visits to four other Centres.

It was found that stores work occupied a disproportionate amount of the managerial time in the GTCs. It was estimated that up to 30 per cent of management time was involved in this work which consisted of stores supervision and checking. Such time could be more profitably devoted to the major function of training.

Instructors appeared to want a stores system which would provide—with the minimum of input by training staff—supplies of tools and materials in class areas as and when required by their course syllabi.

The turnover among stores staff was high and there was a general lack of stores experience. Also stores staff were spending more than two-thirds of their time on paperwork as opposed to the physical stores work.

The fall down rate of supply against requisitions was too high, initial analysis showing a rate of 8 per cent in construction and 15 per cent in engineering requisitions.

The existing holding store at Knockmore, which comprises 20,000 sq. ft. of space in a new warehouse complex some 12 miles west of Belfast, was large enough to serve as a Central Store for all the GTCs. Consequently it was evident that a Central Store could be established without the need to resort to an expensive building project.

It was evident that before computerization could commence it was essential to have a system in operation which could provide an efficient service to users and accurate, up-to-date data for computer input. Various options were considered in relation to these basic requirements such as the total centralization of the stores and supplies organization, the use of a bulk holding store or the continuation of the present arrangements. All the evidence, however, indicated that the most efficient service and the maximum cost advantage would be provided by the centralization of the supply of materials that were normally held in GTC stores leaving only the more bulky items to be delivered to individual Centres as at present. It was further considered that this system would provide the best data flow.

This decision was influenced by various factors amongst which were:

(*a*) It appeared to be improbable that the competence of setting stock levels, preparing and providing usable data and generally in operating the stores to the required standard could be reached and maintained in individual GTC stores.

(*b*) GTC stores could not economically hold the range of items which would be available centrally.

(*c*) Deliveries by suppliers to a convenient central store would be likely to be more satisfactory and would enable materials to be delivered to the more inaccessible GTCs by the Central Store's transport thus guaranteeing an adequate service to these Centres.

(*d*) It would seem that very significant savings could be achieved from bulk purchasing and delivery; in addition, savings in stock holding could be anticipated in the order of 60 per cent providing the consequent release of capital and floor area. It would also provide significant staff savings in GTC stores and in order processing work within the Purchasing Branch.

Primary recommendations

In an interim discussion paper the following recommendations were made:

(*a*) The Department of Manpower Services should take the decision in principle to centralize GTC stores at the existing holding store.

(*b*) A simulation exercise should be mounted by Management Services Division in selected Centres to demonstrate the value of centralization and how this could operate in practice, to assist in the develop-

ment of an organization and systems for centralization and in the establishment of an implementation plan.

Simulation exercise

The Department of Manpower Services selected three Centres—Newry, Enniskillen and Ballymena—to participate in this exercise, which had the following declared objectives:

(*a*) To identify and if possible resolve the potential problems prior to the actual centralization of stores.
(*b*) To monitor the movement of materials from stores on a regular weekly ordering programme.
(*c*) To monitor incidents and issues which could be used as a guide to any necessary increases in shop floor holdings of either tools or materials to meet emergencies.
(*d*) To reassure all concerned about the new procedures which would be required for a Central Stores system, for example, forecasting demand.
(*e*) To develop and test new stores and supplies systems 'on the ground'.

For the purposes of this exercise arrangements were made for instructors to order supplies in weekly batches only for delivery on a specific day each week and for them to forecast two weeks in advance when ordering. It was stipulated that all orders and requests for stores should be authorized by Chief Instructors and should normally be collected from them once per week by stores staff. In addition, on the weekly delivery date stores were to be delivered to instructors by stores staff and items for return to the stores were to be collected at the same time.

To make the exercise as realistic as possible instructors were asked not to contact or visit the stores unless the continuity of training was in danger. Outside the normal weekly issue, all issues from stores or visits to stores involving instructors were to be noted by stores staff for later investigation by management.

Each week, materials that were issued from stores were to be weighed before leaving the stores and in addition the assignment staff were to visit each GTC on the issue day to assess the issue pattern, clear any problems which had arisen and generally to assess shop floor reaction to the experiment.

Results of the simulation exercise

After an initial teething period of some three to four weeks when a number of problems had to be resolved the exercise ran smoothly and indicated that the introduction of a weekly ordering cycle and the isolation of stores from instructors would have little or no effect on training. By the end of the simulation exercise the Centre managers and instructors were in agreement that the only important factor in the stores service was reliability not location or frequency of delivery.

Indeed, after the end of the exercise all the three Centres decided to retain the weekly ordering and 'closed' stores system, as it simplified stores work.

The quantities of stores issued in each Centre during the simulation period varied from week to week with the heaviest weekly consignment in a single Centre being approximately 2·5 tons. Also some individual deliveries, particularly of cut steel, were extremely heavy—a single week's supply for one class could weigh as much as half a ton. Bulky orders were unusual though certain awkward items such as baths, cookers and large diameter piping sometimes had to be transported.

During this period a number of items were identified which were considered to be unsuitable for centralization due mainly to handling difficulties but also due to their low value, storage life or specialized storage requirements. These items included timber, building materials, cement products, fuel oil, bottles of gas and materials for *ad hoc* specialist courses.

Proposals for centralization

The simulation exercise highlighted the need for a reliable, expert and flexible stores service. To provide this it was considered that the organization should be revised and that the central stores and purchasing functions should be separated. It was, therefore, recommended that the existing Central Purchasing Branch should be split into two sections. To make the best use of the available expertise the Head of Branch, who had considerable industrial purchasing experience, should retain control of the Purchasing and Accounts Sections and should undertake the buying for the new Central Store. He should also reorganize the Purchasing Section to take account of the change in ordering pattern which would result from the reductions from 13 stores to one. The Deputy to the Purchasing Officer should take over the responsibility for the Central Store and Stock Record Section, which should move to the Central Store as soon as accommodation became available. The existing clerical staff in the various sections should be retained in the meantime and the industrial staff in the Central Store should be increased to 19—the figure indicated by the assessment in the three Centres during the simulation exercise. To provide the technical expertise at the Central Store the appointment of a Chief Instructor, who should report to the manager in the Store, was recommended.

To ensure that a reliable stores service was provided, that documentation by instructors and industrial staff was minimized, that all unnecessary transcription and recording was eliminated, that stock holding on the shop floor was kept to a minimum with broken tools and surplus materials being returned to the Central Store quickly and that the Central Store was clearly seen to be providing a service to instructors rather than to Centres, a series of recommendations were made covering layout, equipment, stocking, documentation, transport and development of the Central Store.

It was considered to be important to ensure that the Central Store was stocked with a working stock of all common usage items before operations commenced and that deliveries by the Central Store were made to the instructors in the GTCs by Central Store staff, rather than by employing a set down point at each Centre with internal distribution by Centre staff. The key person in this service was to be the Chief Instructor in the Central Store who would provide a link between the industrial stores staff and the instructors in the Centres.

Implementation

Having covered in detail the way in which centralization should be approached and the changes required for it an implementation plan was prepared. This envisaged a phased introduction of the Central Store over a nine-month period. It was decided that initially the Chief Instructor and two stores staff should be appointed to the Central Store and that the split of the Central Purchasing Branch should be put in hand. At the same time work was to begin on buying the initial stock for the Central Store. It was estimated that this represented at least four months' work depending on the pattern of other demands on the Purchasing Section. Concurrently a number of surplus machines which were held in the Holding Store were to be disposed of as it was considered that these would impede the development of the Central Store. To facilitate ordering by instructors the Course Design Team were asked to up-date the course schedules to enable code numbers of items to be quoted when orders were placed.

The concept of a weekly ordering system had to be introduced to the GTCs which had not been involved in the simulation exercise. Management Services Division therefore undertook to conduct an educational programme in relation to the introduction of the system to the staff in these other Centres.

The phased development of the Central Store was so arranged that when the area had been cleared of machinery that was to be disposed of and the revised organization was under development the stores from one large GTC were to be transferred to the Central Store which could then assume responsibility for the stores service to that Centre. This method of development was seen as providing an opportunity to train staff, prove the system and transport arrangements and overcome any unforeseen difficulties in the Central Store system. Additional staff and racking would also become available for work in the Central Store as the demand gradually increased.

Conclusions

It is considered that the centralization of stores and the reorganization of the supplies service will lead to a more efficient and economical operation. In addition, the rationalization of the stores system will facilitate computerization which in turn will provide management information which is not currently available and which will signi-

ficantly help in the work of costing the training activities of GTCs.

The economies of centralization are such that to date estimated annual savings of about £180,000 have been identified made up as shown in *Appendix A*. It has not been possible to evaluate the savings from the expected reduction in stock holdings or the introduction of bulk ordering. However, these will be covered during the next stage of the assignment which is mainly concerned with the introduction of a computerized purchasing, stores and costing system. Work has already started on this and it is hoped that when completed it will be the subject of a further article.

Appendix A

GOVERNMENT TRAINING CENTRE STORES—ESTIMATED ANNUAL RUNNING COSTS

Present system	£
Forty-six industrial stores staff	141,000
Fifteen clerical stores staff	68,300
In the course of the exercise it was estimated that GTC managers spend 10 per cent of their time and assistant managers 20 per cent of their time on stores work at an estimated overall cost of	25,000
Floor space—the average size of a GTC store is estimated at 3,500 sq. ft. and the most recent store acquired for GTC use cost £14,000 per year for 20,000 sq. ft. so the annual cost of GTC stores is estimated at	42,000
Total cost of existing system	£276,300

Proposed centralized system	£
Nineteen industrial stores staff	54,600
No clerical stores staff are required	—
One chief instructor/technical adviser	5,900
Floor space—we estimated that the existing Holding Store at Knockmore is large enough to act as a Central Store serving all GTCs ..	14,000
Transport costs—depreciation plus running costs for two lorries have been estimated at	20,000
Total cost of the proposed system	£94,500

The estimated annual savings, which should be achieved by natural wastage and the redeployment of the staff in post, are therefore ..	£181,800

The Response to the Fulton Report—Part 2

In the August edition of MANAGEMENT SERVICES IN GOVERNMENT we published the first part of an abridged version of a memorandum submitted by CSD to the 'English Committee'. A third and concluding part, covering pensions and retirement, the Civil Service and the community, and accountants, lawyers and research officers, will be published in the February 1977 edition of *MSIG*. —*Editor.*

Personnel management and career planning

Use of specialist skills

Following the reorganization of the Civil Service Commission in 1969, recruitment procedures were speeded up and it has been possible to use these in the recruitment of specialists once departments have defined their needs. A whole range of specialists have been recruited, including geophysicists and petroleum engineers for the Department of Energy in connection with North Sea oil; interpretive and landscape planners and designers for the Countryside Commission; medical officers; and operational research specialists to meet widespread extension of the use of this specialism in the civil areas of government activity.

Various arrangements serve to ensure that special skills are fully used, and to provide avenues for increased responsibility in the formulation of policy and participation in administrative work generally. The individual merit promotion scheme, operated centrally, continues to allow staff making outstanding contributions in scientific and technological research and development to obtain promotion to higher grades without involvement in the managerial responsibilities normally associated with these levels. The trend has been maintained of specialists playing a leading part in the management of their own specialisms. The field of influence of Heads of Professions has been increased in many areas and senior line management is now also more generally involved in personnel management aspects. Centrally there has been an increase in the scope of Management Committees comprising senior specialist staff advising CSD on all aspects of personnel management for the relevant specialist groups. Such Committees now exist for the Science Group, the Professional and Technology Group, Economists, Statisticians, Lawyers, Information Officers and Psychologists. The avenues for specialists to participate in and influence activities outside their specialisms now lie through the open structure at the higher levels, and at lower levels through opportunity posts and lateral movement.

In addition, to give specific effect to the recommendation that the Service should provide training in management and administration to enable these specialists to discharge their responsibilities and to progress

to top management levels, there is a further avenue through the Senior Professional Administrative Training Scheme (SPATS) which has been in operation since May 1972. Its main purpose is to provide those specialists who show potential to reach the more senior posts with an opportunity, early in their careers, to broaden their experience in the wider fields of administration and management. Candidates for SPATS come largely from those who have achieved early promotion to the Principal level within their own specialisms, and those selected attend a specially devised programme of 12 weeks' training in administration and management at the Civil Service College, followed by up to two years in a post (normally in their own department) which will broaden and deepen their knowledge and experience and enable them to return to their specialism better equipped for the responsibilities they may have to assume later in their careers. Since its inception some 224 candidates have been put forward, either on their own initiative or by their department, all have been interviewed by a special panel and 150 have been declared successful.

In response to Fulton's proposals for more specialization in the administrative area, CSD arranged and co-ordinated an analysis by departments of their requirements for particular types of expertise and skills in administrative work. The survey showed that the needs of the work did not accord with the proposal to develop administrators in two main streams: a greater variety of expertise was required and staff would be needed with sufficient breadth of experience to respond to the changing demands of the work. Consequently, the emphasis in carcer development for the Administration Group has been on planning individual careers for a much wider range of staff than previously, using past experience and developing aptitudes where they could best serve departments' requirements for particular knowledge, skills and specializations. To effect this, improved personnel record systems have been set up, personnel staff have been trained in career development techniques, and the scope for developing staff along predetermined career paths has been examined. As a result departments are now much better able to select those with the right aptitudes for well-defined areas of specialization such as ADP work, contracts work, personnel work, etc, and to plan accordingly for individuals to spend a substantial proportion of their careers in these fields.

Management of new entrants and career management

More resources are being devoted to personnel, including career, management. The use of new standard Staff Report Forms and Job Appraisal Reviews is now widespread; and departmental efforts are now being directed to a systematic introduction of career interviews as an aid to planning the general direction of a person's career so as to develop potential to the full. Considerable effort has been devoted to the production of manpower planning models and their use for service-wide and departmental long-term manpower planning projections.

These have helped to indicate ways to reduce the effects of present or potential distortions to grade structures, which also helps to improve career prospects. The emphasis on manpower planning is now passing to departments. The recent introduction of a more refined central personnel record system (PRISM) will aid this work in addition to increasing the facility for matching jobs against individual experience where appropriate. The use of terms such as 'Establishments work' has generally given way to other terms such as personnel work.

Studies were made, between 1969 and 1972, of the scope for regrading in the CO/CA area and at the EO/CO boundary. The studies indicated that the scope for this was not in fact very large. Discussions were opened with the Staff Side and these highlighted a number of pay implications which could not be resolved. However, initiatives have been taken in the personnel management area. Departments are taking steps to identify and make best use of talent in the CO and EO grades: there is general acceptance of CSD's view that it is particularly important for new entrants to these grades to be put on the right path for development from the outset, and Establishment Officers have recently agreed to the re-issue of CSD advice concerning induction arrangements, career interviews in the early years and selection of suitable jobs for young entrants. CSD has encouraged departments to devote increased resources to career management of young EOs in particular, pointing out that, on available evidence, these are likely to be more than offset by consequent reduction in EO wastage in the early years. The AT scheme, which has replaced the old AP scheme, has made it possible for the best of the AT entry to obtain promotion to Principal, via the HEO(A) grade, in as little as four years. In addition, changes have been made to the standard seniority requirements in the Administration Group, enabling good-quality entrants as EOs, both graduates and non-graduates, to obtain early and rapid promotion.

Promotion board procedures have been reviewed and improved, and candidates may now appeal against non-selection for interview. No specific instructions have been issued to departments about the use of a small committee for promotion to posts at the level of Assistant Secretary, Under-Secretary, etc, since the procedure needed varies with the size, etc, of the department concerned, but CSD is consulted about all promotions to Under-Secretary level.

Particular care is being taken to ensure that specialists are included under all centrally devised personnel management policies and that implementing measures are suitably adapted to specialists' needs, particularly in the field of career interviewing. For certain smaller specialist groups, e.g. statisticians and economists, careers are increasingly being managed centrally. At departmental level there has been a considerable increase in the number of specialists in Personnel Divisions, particularly in those departments who employ the largest specialist groups (Science Group and P & T Group). This has been coupled with the development of career development panels or analogous arrangements for

reviewing the career progression of large numbers of staff. In the Science and P & T Groups there is now an agreed policy of early promotion to the Principal level for the most able so as, *inter alia*, to allow them to reach a level where they may compete for open structure posts at a comparable age with members of the Administration Group. Considerable attention has been given to the problems inherent in isolated small groups: this is a difficult problem but some progress has been made to date. The training of specialist staff has been the subject of various detailed reviews both in respect of administration and management training and also in general professional needs (including the correct balance of numbers of professionals who should be 'grown' within the Service). The results have been incorporated in both central and departmental training programmes. The majority of specialists still clearly prefer career paths within their own specialisms, but opportunities for other career paths have been fostered as described below.

Interchange of staff with other employments

A scheme for the interchange of administrators was launched in 1968, after consultation with the CBI, to promote secondments between the Civil Service and industry and other organizations for periods of about two years. Subsequently a task force under the chairmanship of Sir Hermann Bondi considered ways of increasing interchange among scientists from various sectors of employment; and, following its recommendations, a small unit has been established in CSD to facilitate interchange for scientists and engineers working in related fields to and from the Civil Service.

If the experience for secondees is to be of lasting benefit to the people themselves, and to their parent and host organizations, considerable care must be taken in finding jobs which will stretch them and match their needs. The scale of operation of the scheme is therefore conditioned by the considerable effort it takes to identify candidates and jobs and to match the two. It is affected also by the ability of departments and other organizations to release their high-quality staff and to absorb newcomers into key jobs. Both require a degree of sacrifice: the parent organization in releasing key personnel and the host organization in taking someone in who is not immediately 100 per cent effective. Departments are encouraged to arrange their own secondments with other organizations, and for its part CSD actively promotes wider participation by departments and the private sector as well as local authorities and nationalized industries.

So far as the scheme for interchange of administrators is concerned, there are currently 23 civil servants seconded into industry, local authorities and other United Kingdom organizations, and some 56 people from industry and other organizations on secondment into the Civil Service. CSD has sought the participation of more than 80 companies and other organizations during the past two years; the majority,

though favouring the scheme in principle, have been unable to participate at the present time.

Under the scheme relating to scientists and engineers, a total of 52 secondments have been arranged in the period 1973–75, roughly equally by CSD centrally and by departments themselves; 29 secondments have been into the Service and 23 out.

The above figures do not include a considerable number of civil servants seconded to and gaining wider experience in a number of international organizations. Nor do they include people working in the Civil Service on period appointments, who bring outside experience with them and can be expected to resume their normal career in the private sector after completing their assignment in the Service.

Civil Service as a career

The Civil Service has remained a career service. The recommendations on occupational groups have formed part of the background against which the structural developments such as Administrative and Executive Classes, Science and P & T Group mergers have taken place. Arrangements have been introduced for grade skipping in certain occupational groups. In the Science Group, for example, a general provision is made for staff to be promoted two steps above their current grade in exceptional instances, while in the Administration Group promotion to Principal is open to both SEOs and HEO(A)s and similarly an Assistant Secretary post may be filled by either a promoted Principal or a promoted Senior Principal. More generally, however, the shortening of the qualifying period for promotion and the abolition except in certain special cases of a minimum age for promotion ensure that there are no artificial barriers to the rapid progression of the most able and that posts at the higher levels are filled by those most fitted.

Structure

In his statement in the Commons on 26th June 1968 the then Prime Minister said:

> The Government accept the abolition of classes within the Civil Service and will enter immediately into consultations with the staff associations with a view to carrying out the thorough-going study proposed by the Committee, so that a practicable system can be prepared for the implementation of the unified grading structure in accordance with the timetable proposed by the Committee.

The National Whitley Council Joint Committee took the view that the introduction of a new structure was 'far too great an undertaking to be completed in a single heave', and that it would, therefore, need to be tackled by stages. They accordingly drew up a programme of work which included parallel examination of unified grading in various segments, starting at the top; the creation of a common structure at and above Under-Secretary level; the merging of the main general service classes into two or three large interim grading structures, within each of which all class barriers would have been removed; the

absorption of the remaining general service and departmental classes within the merged structures where practicable; the examination of the possible use of supporting grades, as part of an overall study of structure; and development of free lateral movement.

This work led to:

(*a*) The creation of a unified pay and grading structure for all grades of the Service at Under-Secretary level and above from January 1972 (the 'Open Structure').

(*b*) Three major mergers abolishing a number of large classes and creating three new occupational groups: the Administration Group in the General Category from January 1971; the Science Group in the Science Category from September 1971; and the Professional & Technology Group in the Professional & Technology Category from January 1972.

These mergers established the system of categories and occupational groups, with common pay scales within the categories at each grade level. They and the Open Structure accounted for more than half of the non-industrial Civil Service.

As studies proceeded in close consultation with the staff associations, it became apparent that the removal of structural barriers which hampered the efficient and effective deployment of staff was subject to a law of diminishing returns. Restructuring entails a great deal of effort and upheaval which is well worth while where a structural barrier stands in the way of the optimum deployment of a large number of people but much less so where few people need or wish to cross from one group to another. In the latter circumstances it can make better sense to concentrate scarce personnel management resources on identifying and helping the small numbers of individuals to make the move. It was therefore felt best to use scarce skills and experienced personnel management resources on promoting flexibility in staff deployment between different areas of work in the interests of efficiency and individual development rather than on the wide-ranging and comprehensive regrading task involved in unified grading. The Fulton Joint Committee therefore concluded that 'the best course at this juncture would be to pursue the aim of more flexible deployment in the interests of efficiency and staff development by concentrating resources on new arrangements for personnel management and on the development of the category and occupational group system'.

Although this policy involved a departure from the unified grading approach recommended by Fulton, it did not mean the abandonment of further consideration of the extension of unified grading below Under-Secretary level, on which a great deal of exploratory work had already been done. Moreover, consistently with the aims expressed in the Fulton Report, the revised approach continued to seek the creation of structures which would emphasize the unity of the Civil Service while preserving the occupational and other groupings dictated by the

needs of the work and by recruitment, pay and personnel management considerations and ensuring flexibility of staff movement unimpeded by the barriers attributable to the system of classes. This was carried forward by the extension of the system of categories and groups and by providing greater opportunities for movement within and between groups.

Fulton saw the development of free lateral movement between occupational groups as fundamental to the selection of the best man for the job and, with the agreement of the staff associations, arrangements have been introduced to facilitate such movement. Apart from the fitting of specialists for top management posts by training in managerial and administrative skills encouragement is given to transfers of staff to work outside their normal sphere, enabling specialists to move into the generalist area and vice versa. Such transfers may be permanent or (when they are intended to test suitability for other work or to provide a wider range of experience) temporary. In addition, there are some 1,800 posts specifically designated as opportunity posts together with a large number of others where a measure of flexibility regarding the origin of the incumbent exists. These are posts which benefit from a succession of staff from different disciplines passing through them. In these cases the staff remain members of their own disciplines, able to return to their specialisms at the end of their tour of duty. The arrangements are reviewed regularly to ensure that they are operating as fully and effectively as possible.

Since 1972 work on restructuring has accordingly been directed to the further development of the system of categories and occupational groups in three main ways.

The first has been the absorption of general service and departmental classes into existing occupational groups, or by the creation of new groups within existing categories. It was agreed with the Staff Side in 1973 that resources should be concentrated on restructuring the larger classes and that the smaller classes should only be considered if there were compelling reasons or if they were easy to restructure. Economists, Statisticians, Information Officers and Librarians now form separate occupational groups in the General Category. The special departmental class of the Department of Employment, the Court Service Clerks, MOD Group Officers, and GCHQ Specialist Classes have all been absorbed within the Administration Group, and the Agricultural Economist Class within the Economist Group. The Illustrator Class and the MOD Marine Service Grades have become new occupational groups within the P & T Category. The Royal Corps of Naval Constructors, the Royal Naval Engineering Service and the Telecommunications Group BAOR have been absorbed within the P & T Group.

The second main line of development has been the downward extension of the existing categories to cover the supporting grades. We have completed a special study of the lower grades which support scientific and technical work (Project ST), and specific proposals are

under discussion with the Staff Side relating to the structure of the Assistant Scientific Officer and other grades supporting the Science Group, and relating to the absorption within the P & T Group of the Telecommunications Technical Officer and Radio Technician Classes. The possibilities of a merger of the Messenger/Paperkeeper and Office-keeper classes into a new category are also under examination. These studies have shown that the work needs of many of the classes which support existing groups and categories do not readily adapt to the pay and grading requirements for absorption into these categories, and it is becoming increasingly apparent that reclassification as separate categories may in the end be necessary.

The third main line of development has been the formation of new categories as necessary to meet the needs of classes which cannot be fitted appropriately into existing categories. A Training Category has been established to contain the Instructional Group; a Secretarial Category for Typists/Personal Secretaries; a Legal Category for lawyers; a Social Security Category for DHSS Local Officers; a Data Processing Category for Machine Operators (now known as Data Processing Operators); and a Police Category for the Departmental Police. Additional categories are under consideration for Prison Officers, Photoprinters/Duplicator Operators, Teleprinter/Cypher/Radio Operators, and Cleaners; and there may have to be others.

Consideration of the possibility of extending unified grading below Under-Secretary level was resumed in 1975 but, in view of the pay implications of the study, further work was halted following the introduction of the Government's incomes policy restrictions.

By January 1972, when the General, P & T and Science Categories had been established in substantially their present form, they accounted for a little over 50 per cent of the non-industrial Civil Service. Since then we have brought a further 20 per cent of staff within the new structure, and proposals relating to a further 20 per cent are currently at different stages of consideration. The remaining 10 per cent consists mainly of classes which give rise to particularly difficult restructuring problems, and includes a very large number of very small departmental classes (75 per cent of the residual classes in fact contain only about 1½ per cent of the total non-industrial staff). As it can take as long to deal with a small class as with a large one, the effort required to complete the exercise will be considerable and time-consuming whilst the result, in terms of annual percentage advance, will be small.

Progress has been slower than expected partly because of the intrinsic difficulties of each restructuring task, but also because since 1972 incomes policies have placed restrictions on changes involving pay increases (which most do). Very little can be brought to completion under present conditions. It is not possible in these circumstances to judge how much longer it will take to bring the restructuring programme to a satisfactory conclusion or to attempt to set a target date.

Thus, although the restructuring of the Service has not taken the

precise form envisaged in the Fulton Report, the objectives which Fulton set have been, and will continue to be, met in ways which are deemed to be the most effective given the inevitable constraints on suitable resources. Given that the opportunities for promotion in the Service, as in any other organization, are limited by the needs of the work, the progress of an individual in a competitive situation depends upon his ability and suitability for a higher post. Training, job appraisal, career interviewing and other personnel management techniques have been designed to develop the individual's potential; arrangements have been introduced to enable scientific and other professional staff to acquire and use administrative and managerial skills; any barriers to vertical and horizontal movement have been or (by the extension of existing groups and categories, and by the encouragement of lateral movement between occupational groups) are in process of being removed; and appointment to the most senior posts at the top of the Service is open to all, irrespective of their background, who are qualified to fill them. Of some 860 posts at Under-Secretary level and above, nearly 40 per cent are now occupied by people whose earlier service was wholly or mainly in specialist grades.

The new occupational groups and categories are designed specifically to promote the effective management of the work in the particular areas which they cover; yet they are sufficiently flexible to permit their modification to take account of changing pay and personnel management requirements.

Accountable and efficient management

Hiving off

Following the Fulton Report and, later, the 1970 White Paper on the Reorganization of Central Government (Cmnd. 4506), there was extensive consideration of the possibilities for 'hiving off' elements of departmental work. In theory 'hiving off' has advantages as a means of limiting the burden of work on Ministers, and could facilitate the introduction of a greater degree of accountable management. In practice a number of factors have limited its application. Activities which were commercial in character, and were or could be made wholly or largely self-financing, were found to be uncommon within central government. In areas of activity which are not self-financing, the requirements of public financial control limit managerial independence. There are difficulties in removing from ministerial responsibility work which has a high policy content, or significant discretionary authority in relation to individual citizens. In areas with a low degree of direct ministerial involvement, there is a risk that the process of 'hiving off' may in itself simply add to Ministers' burdens. Therefore, the relative advantages and disadvantages of 'hiving off' a particular block of executive work need to be carefully assessed. However, in recent years, important areas of departmental responsibility have been transferred to non-departmental agencies. For example, a major part of the work

of the Civil Aviation Authority, which was set up in 1971, was previously directly performed by the Department of Trade and Industry. More recently, since 1974 a range of functions have been transferred from the Department of Employment to new statutory bodies: the Manpower Services Commission and its Agencies; the Health and Safety Commission and its Executive; and the Advisory Conciliation and Arbitration Service.

Accountable management

Ways in which more effective and accountable management can be achieved within the structure of ministerial responsibility have been the subject of a good deal of study in recent years. Where achievement can be measured in quantitative or financial terms, management accounting is being used increasingly in departments to supplement traditional vote accounting, e.g. the systems being developed in the Employment Service Agency and the Training Services Agency of the Manpower Services Commission. Budgetary control is one of the techniques frequently introduced. Training courses are being run centrally for staff who will be handling the new procedures, and some departments have made their own arrangements. Advice and assistance with implementation is also available at the centre.

With the passage of the Trading Funds Act 1973 it will be possible for units providing certain quasi-commercial services to be financed through trading funds rather than directly from Votes. The Royal Ordnance Factories adopted a trading fund from 1st July 1974, the Royal Mint from 1st April 1975 and PSA (Supplies Division) from 1st April 1976; in HMSO preparatory work for trading fund financing is well advanced.

Where quantitative or financial assessment cannot always be made there has been a large-scale programme of experiments with management by objectives (MbO) covering many different types of work. These now cover some 40 installations, involving 12,000 managers and about 90,000 staff, the largest being that covering the DHSS's regional and local office organization. A review of this programme has shown useful results but also some drawbacks and scope for improvement. Departments report that in some respects MbO has proved over-elaborate and costly to install, and staff sides have in some cases been worried by aspects of reviewing and recording performance which in their view produce unfair pressure on individuals. Where formal systems have been adapted from commercial experience, they have not always been found satisfactory, and the need is now seen in terms not of applying MbO as a single system but of clarifying the general principles which should underlie good management, and recommending practical and flexible guidelines for improving management systems. Following discussion in the National Whitley Joint Committee on Management Services, a joint statement has been issued to guide future developments in this field.

Refinement of hierarchies

The initiative in this area must rest with departments to mould their organization to their own needs. Studies have been carried out of the flow of work in departments and of the working of different kinds of hierarchy. Some departments have already introduced changes in their organization. For instance, the Ministry of Public Building and Works, as it then was, introduced a new structure in 1969 consisting of directorates responsible for the whole of given programmes in which the top posts are open to members of all disciplines.

Departmental Management Services units

A comprehensive review of management services in the Civil Service was carried out in 1969–70 to identify needs and deficiencies, suggest how these should be met, and relate requirement to resources. The review found that much good work had been done, especially at middle and lower levels, but that there was scope for more to be done on higher-level organization, management information and project control.

The review recognized that the requirements of departments differed and took as its objective the setting out of guidelines rather than the provision of a blue-print for the organization of management services in each department. A number of improvements have followed. All major departments now have management services units which can draw upon the range of skills appropriate to their requirements and in all the largest departments management services activities are the sole or major responsibility of an Under-Secretary. There is close co-operation between staff inspection and O & M staff.

A programme of management reviews of all major departments was begun in 1972 and continues. Each review is carried out under the direction of a Steering Committee comprising senior members of the department and representatives of CSD and (in some cases) other departments, and is assisted by a review team comprising staff provided by the department and CSD Management Services Divisions jointly. The team usually includes a management consultant seconded by his company to CSD. These management reviews cover all aspects of the efficiency of a department, including its management and organizational structures and its systems for allocating and controlling resources and for planning and doing its work. Reviews of the following departments have been completed: Scottish Office, Home Office, Inland Revenue, Welsh Office, Treasury, Customs and Excise. Reviews of the Ministry of Defence and CSD are in progress. (See end of articles. *Ed.*)

Training arrangements for senior O & M staff have been reviewed, and new courses have been introduced at Principal level and above. Departments have continued to make use of outside consultants, with the emphasis on association of the internal management services staff with consultants wherever practicable.

Secretarial assistance

The initiative for studies and implementation of the recommendation

for extending shared and central secretarial services rests primarily with departments; but Management Services (General) Division of CSD is undertaking joint reviews with departments in suitable areas as opportunities arise and two studies have been completed recently in DHSS (where the secretarial proposals were invalidated by a subsequent major organizational change) and Welsh Office (where management are currently considering detailed proposals). However, it is clear from these early studies that the recommendation to extend a secretarial service to a greater number of staff is likely to increase the number of Personal Secretaries, typists and clerical staff and these are the grades to which it is hardest to attract recruits. Further studies could be inhibited by staff shortages at these lower levels and the likely additional staff costs.

Planning in departments

Planning in the Civil Service can encompass a range of activities. At departmental level three main fields of planning activity can be identified:

(*a*) The provision of information and data as an input to interdepartmental and 'central' planning: this heading, which includes, for example, the preparation of the Public Expenditure Survey (PESC), Vote and manpower estimates, participation in interdepartmental reviews of policy, and contribution to economic forecasting, is outside the scope of the Fulton proposals.

(*b*) Review of departmental policies to analyse their costs and benefits: work under this heading may take the form of prior analysis of policy options, or of review of existing policies and the arrangements and procedures for carrying them out.

(*c*) Management of resources: work under this heading includes assessment and allocation of financial and manpower resources in the light of the outcome of policy reviews and to reflect decisions on priorities.

The Fulton proposals for planning units seem to be concerned only with the second of these. Departments may, therefore, have units which are responsible for planning but do not undertake the particular functions described by Fulton. Conversely, analysis of policy options may be undertaken by, for example, economists, statisticians and operational research staff, who are not called policy planning units; while virtually every department includes organizational units typically described as 'Policy divisions' which are normally responsible for analysing policy options and advising Ministers on particular aspects of government policy, and for monitoring and reviewing the administration and effectiveness of current policies.

Departments deal with many different tasks in different external circumstances, and it is the business of each to make its own best arrangements. Nearly all the major departments have taken specific

steps in recent years to strengthen their planning machinery in one way or another. The evolution of Programme Analysis and Review (PAR) has led to the setting up of planning machinery in many departments. The PAR procedure involves detailed analysis of the policy options in a particular area of expenditure and subjects are selected so as to cover some 10 or 12 major expenditure programmes each year. It thus complements the broader planning and control of all expenditure which is exercised through the PESC machinery.

The planning systems within a department are always examined during the course of the regular management reviews referred to above.

Similar considerations bear on the organizational concept of a single Senior Policy Adviser, operating separately from the normal policy analysis and other planning work described above. It is also difficult to see how the concept of a single Senior Policy Adviser, standing to some extent apart from normal divisional responsibilities and playing an independent role, can be reconciled with the requirements of accountability and organizational effectiveness which Fulton highlighted. It has generally been judged that the main aims of the recommendation can be better achieved by strengthening the machinery for planning without changing the existing accountabilities of Permanent Secretaries in the field of policy advice. This should ensure that a Minister has adequate policy advice available to him from his senior officials, and that his department is fully alert to outside advice and opinion. The task of the Central Policy Review Staff (CPRS) includes the working out of a better definition of major Government objectives as a strategic background against which the policy on specific major issues can be seen; and also to improve the quality of the analysis available to Ministers collectively on major issues which involve more than one department or are of such national importance that they require collective Cabinet decision. Fulton's recommendation on the need for Chief Scientists has been overtaken by the White Paper *Framework for Government Research and Development* (Cmnd. 5046) published in July 1972. This sets out in detail the arrangements for the management of applied research and development in departments and the role of Chief Scientists.

In recommending that planning units should be staffed by comparatively young people, Fulton hoped that in this way some of the most able, vigorous and suitably qualified young civil servants would be able to have an early and direct impact on top policy-making. In practice, while different types of planning unit need staff of differing experience and qualifications, policy planning units of a non-specialist nature are frequently headed by relatively young Assistant Secretaries of high ability.

Editor's note. The Ministry of Defence and CSD management reviews have now been completed.

Management Bookshelf

Mrs. B. M. HOWARD, Civil Service Department

John Garrett in *The Management of Government* (1972; Penguin; 60p; 303 pages) spoke of the ambivalence of Establishment Divisions simultaneously playing the roles of 'the demon king of manpower control and the fairy queen of personnel management'. Thinking of it another way, you may be reminded of the Pushmi-Pullyu, Hugh Lofting's imaginary quadruped with an outward-facing head at each end of its body. Since this conflict of interest is currently relevant, let us look at some books dealing with both sides of the question.

In the olden days, before Wider Issues became an issue, Nigel Walker on sabbatical leave from the Scottish Home Department produced 'a factual study of the psychological aspects of being a bureaucrat in a modern democracy'. His book, *Morale in the Civil Service* (1961; Edinburgh University Press; 302 pages), examines the conditions of work and the satisfaction it brought to clerical and executive staff in the Civil Service—and in particular to one large 'clerical factory'—compared with their counterparts in commercial firms.

In the 15 years since that book was published much has been written about the psychological needs of workers, but the niceties of job enlargement, job rotation and other attempts to improve job satisfaction are often regarded by the average manager as distinctions without much difference. A recent paperback from the Institute of Personnel Management, *Techniques and Developments in Management* (1975; £1·30; 184 pages), may disabuse him and may even mitigate some of his cynicism about 'the flavour of the month' approach to innovation. The first part of the book deals with the individual: flexible working hours, staff status, job rotation and various forms of worker participation. The second part describes methods for achieving corporate objectives such as manpower planning, OD, human resource accounting. Notes on the advantages and dangers of the practices described are particularly interesting. A larger and more comprehensive work of reference on the modern approach is the *Management Development and Training Handbook*, edited by Bernard Taylor and Gordon Lippitt (1975; McGraw-Hill; £10; 650 pages), a symposium of articles specially commissioned from recognized authorities. Its five sections cover management development, management training methods, management training programmes, organizational development, planning and organization. There is a comprehensive index and a good bibliography. Although intended to give practical help to managers, it will, perhaps, become a convenient textbook for teachers, researchers and students of management.

Both these volumes describe manpower planning techniques; in the

latter the section was written by A. R. Smith, until recently Director of Statistics, CSD. It was in this capacity that he edited *Manpower Planning in the Civil Service* (HMSO; forthcoming), the third volume in the Civil Service Studies series. His co-authors were also from CSD Statistics Division which is responsible for the development of manpower planning techniques and for helping the Civil Service College to encourage their appreciation in the Civil Service. The book is intended for the experienced administrator, hopefully both intelligent and numerate, but with no specialist skills or academic background, who is (or one day might be) involved with personnel management.

Anyone seeking further information about manpower planning may wish to read more widely. They might, therefore, care to direct their attention to the pages of the *Department of Employment Gazette* where Clive Purkiss of the Institute of Manpower Studies is surveying the 'Manpower Planning Literature' in a series of quarterly articles, the first of which appeared in the July 1976 issue. The first article covered general topics; later ones are promised on labour wastage, control and estimation of manpower levels, the analysis of supply, the management of information for manpower planning, and so on. For several years the *Gazette* has regularly carried articles on manpower planning; a special series is contained in the January, April, July and October issues this year. These discuss the problems inherent in specific sectors of the economy (such as the NHS, the catering industry, etc.) and in certain employment categories; other papers are case histories and methodological studies: among them 'Manpower Supply Planning—Getting Started' in the January issue.

Journal articles are frequently very relevant to immediate problems since they are inherently more up to date than the average book. From time to time whole issues of periodicals are devoted to one topic—for example, manpower planning occupied the November 1965 number of the *British Journal of Industrial Relations* and the first issue of the 1971 volume of *The Statistician*. *Personnel Review* concentrated on current development in manpower planning in the summer of 1972; it has done the same thing in its summer 1976 issue. It is interesting to compare the two issues: one published in a highly competitive labour situation, the other at a time of economic recession when the problem is to cope with the difficulties arising from a labour surplus rather than from a deficiency. Among the articles in the 1976 issue is one by Bartholomew, Hopes and Smith (the latter two from CSD) which describes some of the statistical techniques used in 'Manpower Planning in the Face of Uncertainty' and stressing the mutually dependent roles of statistician and manager in the corporate planning process. Two papers: 'The Cusum Chart—a supergraph for personnel managers' by Mahon and Jones, and 'Life Table Analysis and Manpower Statistics' by Conway, discuss techniques useful to the personnel specialist in analysing manpower statistics. 'Redundancy: a psychological problem?' by Hartley and Cooper considers some of the gaps in our knowledge of the psycho-

logical effects of redundancy—for example, little is known about the effects on managerial staff or on the family or, for that matter, on the organization itself after a selective redundancy programme.

To conclude, let me suggest to you two recent Penguin paperbacks, both collections of readings and both therefore giving a wide overview of their respective subjects. *Job Satisfaction: challenge and response in modern Britain*, edited by Mary Weir (1976; £1·75; 288 pages) and *Manpower Planning*, edited by D. J. Bartholomew (1976; £1·50; 335 pages). One for the fairy queen and one for the demon king. But which for who, is not for me to say!

Readers may like to be reminded of the titles that are available in the Management Services Handbook series, published by CSD Management Services. They are:

E.125 *Typing services* (44 pages, price 45p)
E.130 *Forms control* (38 pages, price 60p)
E.132 *Centralized dictation systems* (25 pages, price 45p)
E.133 *Transport management* (32 pages, price 55p)
E.134 *Microcopying systems* (55 pages, price £1·30)

Departments may obtain copies from HMSO through their normal departmental publications demand channels. Persons and organizations outside the Civil Service may obtain copies from Civil Service Department (MSSU), Room 2/100 Old Admiralty Building, Whitehall, London SW1A 2AZ. Orders must be accompanied by a cheque or postal order, made payable to 'Civil Service Department'. The prices quoted above include postage (within UK).

The availability of two further titles in the series:

E.136 *Management accounting in the Civil Service*
E.137 *Glossary of accounting terms*

will be announced shortly.

Computer Installations for Government Departments

A list of all Government computers as at 1st January 1976 was published as a supplement to the May 1976 edition of MANAGEMENT SERVICES IN GOVERNMENT. Details of computers ordered during the period 1st April to 30th June 1976 are shown in the following table.

DATE OF ORDER	DEPARTMENT[1]	LOCATION	MAIN USES	MANUFACTURER[2] AND TYPE OF COMPUTER
2B Computers on order for scientific and technical purposes				
April 1976	MOD (PE)	Malvern	Radar research	CTL Modular 1
April 1976	MOD (Navy)	Manadon	Training of Engineering Officers	DEC PDP 11/10
June 1976	MOD (PE)	Aberporth	Range data analysis	DEC PDP 15

Note: No computers for administrative and general purposes were ordered during this period.

[1] Department key (*Column* 2)

MOD (Navy)	Ministry of Defence (Navy)
MOD (PE)	Ministry of Defence (Procurement Executive)

[2] Manufacturer key (*Column* 5)

CTL	Computer Technology Ltd.
DEC	Digital Equipment Company (UK) Ltd.

Corrigenda to May and August 1976 editions:

May edition: Page 7 of Supplement, penultimate entry, column 5: *delete* 'IBM 700' and *substitute* 'DEC PDP 11/05'

August edition: First entry, column 3: *delete* 'Livingstone' and *substitute* 'Livingston'; and *amend* column 4 *to read* 'Unemployment benefits'
Second entry, column 4: *amend to read* 'Unemployment benefits'

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Printed in England for Her Majesty's Stationery Office
by The Campfield Press, St. Albans